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Building Component Maintenance and Repair Data Base: Plumbing Systems

by
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This research project has provided improved maintenance resource data for use during facility planning, design and maintenance activities. Data bases and computer systems have been developed to assist planners in preparing DD Form 1391 documentation, designers in life-cycle cost component selection, and maintainers in resource planning. The data bases and computer systems are being used by U.S. Army Corps of Engineers (USACE) designers at the District and installation levels and by resource programmers at USACE Headquarters, and Army Major Commands and installations. These research products may also be useful to other Government agencies and the private sector.

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FOREWORD

This research was conducted for Headquarters, U.S. Army Corps of Engineers and the Office of the Assistant Chief of Engineers under various research, development, testing, and evaluation (RDTE) and reimbursable funding documents. Work began under RDTE in 1980 and continued in reimbursable projects during 1984 through 1989. The technical monitor for the RDTE part was Dr. Larry Schindler (CEMP-EC) and for the reimbursable part was Ms. Val Corbridge (DAEN-ZCF-R).

The work was performed by the Facility Systems Division (FS), U.S. Army Construction Engineering Research Laboratory (USACERL). The Principal Investigators were Dr. Edgar Neely and Mr. Robert Neathammer (USACERL-FS). The primary contractor for much of the data development was the Department of Architectural Engineering, Pennsylvania State University. Dr. Michael O'Connor is Chief of USACERL-FS.

COL Everett R. Thomas is Commander and Director of USACERL, and Dr. L.R. Shaffer is Technical Director.

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BUILDING COMPONENT MAINTENANCE AND REPAIR DATA BASE: PLUMBING SYSTEMS

1 INTRODUCTION

Background

Maintenance* and repair (M&R) cost estimates are needed during planning, design, and operations/maintenance of Army facilities. During planning, life-cycle costs are needed to evaluate alternative ways of meeting requirements (e.g., lease, new construction, renovate existing facilities). During design, M&R requirements for various types of components, such as built-up or shingle roofs, are needed so that the total life-cycle cost of different designs can be minimized. Finally, once the facility has been constructed, outyear predictions of maintenance and repair costs are needed so that enough funds can be programmed to ensure that Army facilities are maintained properly and do not deteriorate due to lack of maintenance.

The Directorate of Engineering and Construction (EC), Headquarters, U.S. Army Corps of Engineers (HQUSACE),** asked the U.S. Army Construction Engineering Research Laboratory (USACERL) to coordinate the assembly of a single centralized maintenance and repair data base for use by Corps designers. This research was required because designers were not able to obtain reliable maintenance and repair data to support their life-cycle cost (LCC) analysis from installations or from the technical literature. One of the first tasks in the research effort was to determine if reliable data bases, which could be adapted for Corps use, existed in government or private industry. Comprehensive data bases of maintenance costs for government and private sector facilities did not exist. The little data available always depended on widely varying standards of maintenance used to maintain the facilities for which the data was collected and thus was unreliable for prediction purposes. Recognizing this, HQUSACE asked USACERL to develop a maintenance and repair cost data base. This data is for use by U.S. Army Corps of Engineers (USACE) designers in performing life-cycle cost analyses during the design of new facilities. Initial results were presented in several USACERL reports.[1]

Soon after this request, the Facilities Programming and Budgeting Branch of the Facilities Engineering Directorate asked USACERL to develop prediction models for outyear maintenance requirements of the Army facility inventory. The Programming Office of EC, responsible for Military Construction, Army (MCA) planning, also requested that USACERL provide methods and automated tools to help installations perform economic analyses. Part of the objective was to allow analysts to obtain future maintenance cost data.

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*Maintenance in this report means all work required to keep a facility in good operating condition; it includes all maintenance, repair, and replacement of components required over the life of a facility.

**At the time of this request, EC was part of the Office of the Chief of Engineers, which has since reorganized. In addition, EC has now become the Directorate of Military Programs.

[1] R.D. Neathammer, *Life-Cycle Cost Database Design and Sample Cost Data Development*, Interim Report P-120/ADA0997222 (U.S. Army Construction Engineering Research Laboratory [USACERL], February 1981); R.D. Neathammer, *Life-Cycle Cost Database: Vol I, Design*, and *Vol II, Sample Data Development*, Technical Report P-139/ADA126644 and ADA126645 (USACERL, January 1983), Appendices E through G.

In response to these requests, USACERL began a multiyear effort to develop a comprehensive maintenance and repair cost research program for buildings. This coordinated program is the key to all detailed estimation of future maintenance costs for Army facilities.

Research Performed and Reports Published

This is one of several interrelated reports addressing maintenance resource prediction in the facility life-cycle process. The total research effort is described in a USACERL Technical Report.[2]

The first research product was a data base containing maintenance tasks related to every building construction component. This data base provides labor, material, and equipment resource information. The frequency of task occurrence is also included. This information is published in a series of four USACERL Special Reports by engineering systems: (1) architectural, (2) heating, ventilating, and air-conditioning (HVAC), (3) plumbing, and (4) electrical. The title for the series is *Maintenance Task Data Base for Buildings* (the present report covers architectural systems for this series).[3] Table 1 shows an example from this data base. This data is also available in electronic form. The data base is used in a personal computer (PC) system under the Disk Operating System (DOS). This computer program allows a facility to be defined by entering the components and component quantities comprising the facility. The tasks are used to determine the resources required annually to keep the facility maintained.

The second research product was a component resource summary for the first 25 years of a facility. The tasks for the component were scheduled and combined into one set of annual resource requirements. This annual resource information is published in a series of four USACERL Special Reports titled *Building Component Maintenance and Repair Data Base.*[4] An example from this data base is shown in Table 2. The data base is also available in electronic form. This data can be used to perform special economic analyses such as one for a 20-year life using a 10 percent discount rate.

The third research product was a set of 25-year present worth factor tables for use by designers in selecting components for discount rates of 7 and 10 percent. The annual component resource values were multiplied by the appropriate present worth factor and added for the 25 years to produce one set of resource values. This information is published in a series of four USACERL Special Reports titled

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[2] E.S. Neely, R.D. Neathammer, J.R. Stirn, and R.P. Winkler, *Maintenance Resource Prediction in the Facility Life-Cycle Process*, Technical Report P-91/10 (USACERL, March 1991).

[3] E.S. Neely, R.D. Neathammer, J.R. Stirn, and R.P. Winkler, *Maintenance Task Data Base for Buildings: Heating, Ventilation, and Air-Conditioning Systems*, Special Report P-91/21 (USACERL, May 1991); E.S. Neely, R.D. Neathammer, J.R. Stirn, and R.P. Winkler, *Maintenance Task Data Base for Buildings: Plumbing Systems*, Special Report P-91/18 (USACERL, May 1991); E.S. Neely, R.D. Neathammer, J.R. Stirn, and R.P. Winkler, *Maintenance Task Data Base for Buildings: Electrical Systems*, Special Report P-91/25 (USACERL, May 1991), and E.S. Neely, R.D. Neathammer, J.R. Stirn, and R.P. Winkler, *Maintenance Task Data Base for Buildings: Architectural Systems*, Special Report P-91/23 (USACERL, May 1991).

[4] E.S. Neely, R.D. Neathammer, J.R. Stirn, and R.P. Winkler, *Building Component Maintenance and Repair Data Base for Buildings: Architectural Systems*, Special Report P-91/27 (USACERL, May 1991); E. S. Neely, R. D. Neathammer, J.R. Stirn, and R.P. Winkler, *Building Component Maintenance and Repair Data Base for Buildings: Heating, Ventilation, and Air-Conditioning Systems*, Special Report P-91/22 (USACERL, May 1991); E.S. Neely, R.D. Neathammer, J.R. Stirn, and R.P. Winkler, *Building Component Maintenance and Repair Data Base for Buildings: Electrical Systems*, Special Report P-91/19 (USACERL, May 1991).

Table 1

Typical Task Data Form

Task Code: 0811202

Component: FLUSH-TANK WATER CLOSET System: SANITARY Subsystem: FIXTURES

Task Desription: M/R REPLACE WASHER IN BALL COCK

Unit of Measure: COUNT Frequency of Occurence: H: 4.00 A: 5.00 L: 6.00
Once every (H,A,L) years

Persons per Team: 1 Task Duration: 0.1872 hours

Trade: PLUMBING Task Classification: 0

Labor Resources

Subtask Description	Labor Hours
1. TURN VALVE ON AND OFF	0.008000
2. REMOVE AND INSTALL COVER	0.017000
3. REMOVE AND INSTALL 2 SCREWS	0.035000
4. REMOVE/INSTALL VALVE ROD LIFTER	0.004000
5. REMOVE AND INSTALL VALVE ROD	0.004000
6. REMOVE WASHER	0.023000
7. INSTALL WASHER	0.013000
8. GRIND VALVE SEAT	0.016000
9. CHECK OPERATION	0.024000

Material Resources

Description	Quantity	Unit Cost
WASHER	1	0.1700
		0.1700

SUMMARY

Resources	UOM	Direct	Indirect	Total
Labor	Hours	0.144000	0.043200	0.187200
Material	Cost $	0.170000		0.170000
Equipment	Hours			0.187200

Table 2

Typical Components Summary

25 Year Component Listing

CACES No.: 081110-Tank-Less Water Closet 081120 - Flush-Tank Water Closet

Labor Hours	Materials $	Equipment Hours	YR	Labor Hours	Materials $	Equipment Hours
0.0000	0.0000	0.0000	1	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	2	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	3	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	4	0.0000	0.0000	0.0000
1.5821	1.3992	1.5821	5	1.7693	1.5794	1.7693
0.0000	0.0000	0.0000	6	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	7	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	8	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	9	0.0000	0.0000	0.0000
1.6926	13.3772	1.6926	10	1.7693	1.5794	1.7693
0.0000	0.0000	0.0000	11	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	12	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	13	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	14	0.0000	0.0000	0.0000
1.5821	1.3992	1.5821	15	2.9796	18.0094	2.9796
0.0000	0.0000	0.0000	16	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	17	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	18	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	19	0.0000	0.0000	0.0000
1.6926	13.3772	1.6926	20	1.8832	1.7066	1.9032
0.0000	0.0000	0.0000	21	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	22	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	23	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	24	0.0000	0.0000	0.0000
1.5821	1.3992	1.5821	25	1.7693	1.5794	1.7693

Building Maintenance and Repair Data for Life-Cycle Cost Analyses.[5] Table 3 shows an example from this data base. The data base is also available in electronic form. The first three resource columns provide data to allow designers to calculate the life-cycle costs at any location by multiplying by the correct labor rate, equipment rate, and material geographic factor. The multiplication and addition have been performed for the Military District of Washington, DC, and results are given in the fourth column of the table. The right section of the table is information that can be entered into computer systems that perform life-cycle cost analysis.

[5] E.S. Neely, R.D. Neathammer, J.R. Stirn, and R.P. Winkler, *Building Maintenance and Repair Data for Life-Cycle Cost Analyses: Architectural Systems*, Special Report P-91/17 (USACERL, May 1991); E.S. Neely, R.D. Neathammer, J.R. Stirn, and R.P. Winkler, *Building Maintenance and Repair Data for Life-Cycle Cost Analyses: Heating, Ventilation, and Air-Conditioning Systems*, Special Report P-91/20 (USACERL, May 1991); E.S. Neely, R.D. Neathammer, J.R. Stirn, and R.P. Winkler, *Building Maintenance and Repair Data for Life-Cycle Cost Analyses: Plumbing Systems*, Special Report P-91/24 (USACERL, May 1991); E.S. Neely, R.D. Neathammer, J.R. Stirn, R.P. Winkler, *Building Maintenance and Repair Data for Life-Cycle Cost Analyses: Electrical Systems*, Special Report P-91/26 (USACERL, May 1991).

Table 3

Life-Cycle Cost Analysis

EPS BASED MAINTENANCE AND REPAIR COST DATA FOR USE IN LIFE CYCLE COST ANALYSIS ($ PER UNIT MEASURE) PAGE 15

COMPONENT DESCRIPTION		PRESENT WORTH OF ALL 25 YEAR MAINTENANCE AND REPAIR COSTS (d = 10%)				ANNUAL MAINTENANCE AND REPAIR PLUS HIGH COST REPAIR AND REPLACEMENT COSTS						
		By Resources			Washington D.C. Total	Annual Maintenance and Repair			Replacement and High Costs Tasks			
	um	labor	material	equipment		labor	material	equipment	Yr	labor	material	equipment
PLUMBING												
SANITARY												
FIXTURES												
TANK-LESS WATER CLOSET	CT	1.89994	6.68070	1.89994	46.94	0.26563	0.93402	0.26563	35	2.02280	183.09700	1.01140
FLUSH-TANK WATER CLOSET	CT	2.31668	4.96386	2.31668	54.05	0.32389	0.69399	0.32389	35	4.11190	79.06540	2.05595
URINAL	CT	2.89694	10.98923	2.89694	72.38	0.40502	1.53640	0.40502	35	2.13330	167.48000	1.06665
LAVATORY, IRON ENAMEL	CT	2.63599	17.12850	2.63599	72.99	0.36854	2.39472	0.36854	40	1.99550	138.44660	0.99775
LAVATORY, VITREOUS CHINA	CT	2.63599	17.12850	2.63654	72.99	0.36854	2.39472	0.36854	35	1.99680	142.18840	0.99840
LAVATORY, ENAMELED STEEL	CT	2.63654	17.12850	2.06822	73.00	0.36861	2.39472	0.36861	35	1.99680	61.79800	0.99840
BATHTUB, CAST IRON ENAMEL	CT	4.06822	42.96166	4.06822	129.17	0.56877	6.00644	0.56877	40	13.00000	341.29880	6.50000
BATHTUB, ENAMELED STEEL	CT	5.47173	44.30948	5.47173	160.26	0.76500	6.19488	0.76500	35	3.34100	174.12620	1.67050
SHOWER, TERRAZO	CT	3.90504	24.15328	3.90504	106.90	0.54596	3.37685	0.54596	30	98.91700	243.69400	49.45850
SHOWER, ENAMELED STEEL	CT	3.90504	24.15328	3.90504	106.90	0.54596	3.37685	0.54596	35	3.36700	262.88000	1.68350
SHOWER, PLASTIC	CT	4.01848	30.66697	3.82134	115.19	0.50670	2.55230	0.50670	20	3.36700	105.98940	1.68350

A fourth research product was a PC system that allows facilities to be modeled by entering the components that comprise the facility. Future years resource predictions are produced by applying the individual tasks and then forming resource summaries by subsystems, systems, facilities, installations, reporting installations, Major Commands (MACOMS) and Army. A summary level computer system was also developed for use by the Department of the Army (DA) and MACOMS. The summary level system applies the most basic data contained in the current facility real property inventory files: (1) current facility use, (2) floor area, and (3) construction date. Users and systems manuals will be published as USACERL ADP Reports.

Objective

The objective of this report is to describe the component summaries for plumbing systems and give examples for using these tables in performing life-cycle cost analyses during the design process.

Approach

The first activity in the research was to survey the literature for available maintenance data. No comprehensive task resource data base was located. The Navy has developed a series of manuals dealing with labor hours required to perform several basic maintenance tasks. This work has been adopted by the Department of Defense (DOD) for tri-service use. A series of Technical Bulletins (TBs) under the general title *Engineered Performance Standards* has been published.

The next activity was to survey USACE District offices to solicit their input for a data base. A guiding committee composed of District personnel, installation representatives, and private sector consultants met and agreed upon a general data base design. More importantly, they recommended that the data base be developed using the Engineered Performance Standards rather than historical data.

Once the data base was developed, component summaries were created by summing all tasks for a component. These summaries were then input into a program that computed present worth values for each component.

The calculation procedures described in this report were performed and summarized for standard Army life-cycle analysis of 25 years with a 7 or 10 percent worth factor. Final results are published in the USACERL Special report series *Building Maintenance and Repair Data Base for Life-Cycle Analyses.*

Scope

The 25 year component resource summary tables are for DOD designers and can also be used by those in the private sector.

Mode of Technology Transfer

The tables pertinent to designer use will be issued as a supplement to Technical Manual (TM) 5-802-1, *Economic Studies for Military Construction Design—Applications.*

2 PROBLEM DEFINITION

In the facility life-cycle process, costs are incurred in construction, operation, maintenance, and disposal of a facility. Past emphasis during the planning, design, and construction phases has been on estimating initial construction costs. The impact of operating and maintaining facilities has always been a secondary consideration. In many cases, the operation and maintenance (O&M) costs are far greater than initial construction costs. Building owners are concerned with the total ownership costs of facilities rather than just the initial construction costs.

The Army has realized the importance of performing total life-cycle cost analyses for facilities at the design stage of accurately forecasting these costs for funds programming. HQUSACE asked USACERL in 1980 to develop a method of estimating future maintenance costs for buildings. In 1982, the programming branch of the former Facilities Engineering Directorate asked USACERL to develop effective models for forecasting facility maintenance resource requirements based on the actual facility.

Life-cycle cost economic studies are an integral part of facility design in the MCA program. Requirements for performing these studies are given in:

- Statutes, Code of Federal Regulations, and Executive Orders for performing analyses when energy is a key cost and for wastewater treatment plants
- USACE *Architectural and Engineering Instructions: Design Criteria*
- Army Regulation (AR) 11-28, *Economic Analysis and Program Evaluation for Resource Management* for general economic analyses
- TM 5-802-1, *Economic Studies for Military Construction Design--Applications*

The main purpose of these studies is to minimize the life-cycle costs of Army facilities.

To perform life-cycle cost analyses on facility designs, three categories of costs are needed: initial, operating, and maintenance. Initial costs are usually easy to estimate through existing cost estimating systems such as the Corps of Engineers Computer Assisted Cost Estimating System (CACES) and standard publications such as Means or Dodge. Operating costs can be estimated by using energy consumption models such as the Corps of Engineers Building Loads Analysis and System Thermodynamics (BLAST) program or the Trane Company's Trace program. However, accurate estimates of maintenance costs are not available.

There are no comprehensive data bases of maintenance costs for building components either in the private sector or State/Federal Governments. Some historical data is available from the Building Owners' and Managers' Association reports. Within the Army, the Integrated Facilities System (IFS) contains some historical data; however, it does not have a feature for retaining several types of a building component (e.g., having brick and wood exteriors or three types of floor covering). Moreover, the data in IFS has not been kept current. For example, at one installation several family housing units were shown as having wood siding when, in fact, they had been covered with aluminum siding several years earlier.

3 DATA BASE DEVELOPMENT

The first step in data base development was to subdivide a building into systems, subsystems, and components, and define maintenance tasks. The second step was to estimate resources for each task. The third step was to schedule these tasks in appropriate years and combine them into one total for each component.

Building Subdivision

The UNIFORMAT method of dividing a building into systems, subsystems, and components was adopted since it is used by most Federal agencies and many private organizations. Systems requiring little maintenance such as foundations and superstructure were not subdivided.

The level of component detail was determined by maintenance and design personnel. This level varied, depending on the facility classification (e.g., historical) and the costs to collect and maintain data versus the benefit. Appendix A contains a complete list of the subdivisions.

Task Data Development

A typical task data form is shown in Table 1. The Engineered Performance Standards (EPS) adopted by all DOD agencies were applied to determine labor resources. A USACERL Technical Report contains a full explanation of use of EPS in developing these resources.[6]

Standard references such as DA criteria documents, Corps of Engineers Unit Price Manuals, Means, and Dodge were used to determine the Washington, DC, area material costs. Material costs in the data base are given in July 1988 dollars for this area. Material costs can be adjusted for site location by applying a geographic location adjustment factor similar to the values shown in Appendix B. Material costs can be adjusted for inflation by applying a time adjustment factor from July 1988 to the new point in time (i.e., inflation indexes provided by the HQUSACE cost estimating branch can be used to adjust the 1988 material costs to future years).

Task frequencies are the most subjective portion of the data base and were determined by applying professional experience, trade publication data, and data in manufacturers' literature. A range of values is given to provide more information than one average frequency.

The data base has been reviewed by 10 installation Directorates of Engineering and Housing (DEHs) and has been determined to accurately represent the resources required to perform the tasks. This data base serves as the foundation for the tables published in this report. The complete data base is not duplicated in this report due to its size, but is available in the USACERL Special Report series titled *Maintenance Task Data Base for Buildings.*

[6] E.S. Neely, et al., TR P-91/10 (USACERL, March 1991).

Component Summary Tables

Table 2 is a typical component summary. The development process is illustrated by using the labor resource for the flush tank water closet component. All tasks related to the water closet component are listed in Table 4, with a summary in Table 5. The average frequency is used to project times of occurrence of M&R tasks for the first 25-year period as shown in Table 6. The "total" column in Table 6 is identical to the labor column in Table 2.

Table 4

Tasks for a Flush Tank Water Closet

TASK DATA FORM

Task Code: 0811201

Component: FLUSH-TANK WATER CLOSET System: SANITARY Subsystem: FIXTURES
Task Description: R/R UNPLUG CLOGGED LINE
Unit of Measure: COUNT Frequency of Occurrence: N: 5.00 A: 5.00 L: 7.00
Persons per Team: 1 Task Duration: 1.5821 hours Once every (N,A,L) years
Trade: PLUMBING Task Classification: 0

Labor Resources

Subtask Description	Labor Hrs
1.TURN VALVE OFF AND ON	0.088000
2.REMOVE PACKING NUTS	0.109000
3.REMOVE/INSTALL NUTS FROM BOLTS	0.070000
4.REMOVE BOWL FROM FLANGE/INSTALL	0.194000
5.REMOVE GASKET	0.009000
6.UNPLUG LINE	0.150000
7.INSTALL GASKET	0.023000
8.APPLY PUTTY	0.132000
9.CLEAN PUTTY/BOWL FOUNDATION	0.136000
10.CONNECT PACKING NUTS	0.115000
11.CHECK OPERATION	0.167000
12.MOVE MATERIAL	0.104000

Material Resources

Description	Quantity	Unit Cost
PUTTY	6 oz	0.2200
		1.3200

SUMMARY

Resource UOM		Direct	Indirect	Total
Labor	Hours	1.217000	0.365100	1.582100
Material	Cost $	1.320000		1.320000
Equipment	Hours			1.582100

Components in This Task: 0811200

Table 4 (Cont'd)

TASK DATA FORM

Task Code: 0811202

Component: FLUSH-TANK WATER CLOSET System: SANITARY Subsystem: FIXTURES
Task Description: R/R REPLACE WASHER IN BALL COCK
Unit of Measure: COUNT Frequency of Occurrence: M: 4.00 A: 5.00 L: 6.00
Persons per Team: 1 Task Duration: 0.1872 hours Once every (M,A,L) years
Trade: PLUMBING Task Classification: 0

Labor Resources

Subtask Description	Labor Hrs
1.TURN VALVE ON AND OFF	0.008000
2.REMOVE AND INSTALL COVER	0.017000
3.REMOVE AND INSTALL 2 SCREWS	0.035000
4.REMOVE/INSTALL VALVE ROD LIFTER	0.004000
5.REMOVE AND INSTALL VALVE ROD	0.004000
6.REMOVE WASHER	0.023000
7.INSTALL WASHER	0.013000
8.GRIND VALVE SEAT	0.016000
9.CHECK OPERATION	0.024000

Material Resources

Description	Quantity	Unit Cost
WASHER	1	0.1700
		0.1700

SUMMARY

Resources	UOM	Direct	Indirect	Total
Labor	Hours	0.144000	0.043200	0.187200
Material	Cost $	0.170000		0.170000
Equipment	Hours			0.187200

Components In This Task: 0811200

TASK DATA FORM

Task Code: 0811203

Component: FLUSH-TANK WATER CLOSET System: SANITARY Subsystem: FIXTURES
Task Description: R/R REPLACE WORN PARTS IN WATER CLOSET
Unit of Measure: COUNT Frequency of Occurrence: M: 13.00 A: 15.00 L: 17.00
Persons per Team: 1 Task Duration: 1.2103 hours Once every (M,A,L) years
Trade: PLUMBING Task Classification: 0

Labor Resources

Subtask Description	Labor Hrs
1.TURN VALVE OFF AND ON	0.008000
2.REMOVE AND INSTALL COVER	0.017000
3.REMOVE/INSTALL FLOAT ON ROD	0.018000
4.REMOVE/INSTALL FLOAT ROD	0.025000
5.REMOVE AND INSTALL FLOAT VALVE	0.077000
6.CLEAN VALVE SEAT	0.067000
7.REMOVE/INSTALL LOCK NUT	0.021000
8.REMOVE WASHER ON FLOAT VALVE	0.013000
9.INSERT WASHER ON FLOAT VALVE	0.013000
10.REMOVE/INSTALL ROD IN BALL	0.025000
11.REMOVE AND INSTALL LIFT ROD	0.025000
12.REMOVE/INSTALL RUBBER BALL	0.077000
13.REMOVE/INSTALL FLUSH PIPE NUTS	0.043000
14.REMOVE/INSTALL LOCK NUTS	0.043000
15.INSTALL RUBBER GASKETS	0.048000
16.ADJUST PARTS	0.188000
17.CHECK OPERATION	0.167000
18.REMOVE/INSTALL SUPPLY SLIP NUT	0.021000
19.MOVE MATERIAL	0.035000

Material Resources

Description	Quantity	Unit Cost
REPAIR KIT	1	15.5000
		15.5000

SUMMARY

Resources	UOM	Direct	Indirect	Total
Labor	Hours	0.931000	0.279300	1.210300
Material	Cost $	15.500000		15.500000
Equipment	Hours			1.210300

Components In This Task: 0811200

Table 4 (Cont'd)

TASK DATA FORM

Task Code: 0811204

Component: FLUSH-TANK WATER CLOSET System: SANITARY Subsystem: FIXTURES
Task Description: R/R INSTALL GASKET IN SPUD CONNECTION
Unit of Measure: COUNT Frequency of Occurrence: M: 17.00 A: 20.00 L: 23.00
Persons per Team: 1 Task Duration: 0.1339 hours Once every (M,A,L) years
Trade: PLUMBING Task Classification: 0

Labor Resources

Subtask Description	Labor Hrs
1.TURN VALVE OFF AND ON	0.017000
2.LOOSEN LOCKNUT	0.011000
3.REMOVE SPUD CONNECTION	0.013000
4.REMOVE GASKET OR WASHER	0.013000
5.CLEAN SPUD SEAT	0.016000
6.INSTALL NEW GASKET OR WASHER	0.002000
7.INSTALL SPUD CONNECTION	0.013000
8.TIGHTEN LOCKNUT	0.011000
9.INSPECT CONNECTION	0.007000

Material Resources

Description	Quantity	Unit Cost
GASKET	1	0.1200
		0.1200

SUMMARY

Resources	UOM	Direct	Indirect	Total
Labor	Hours	0.103000	0.030900	0.133900
Material	Cost $	0.120000		0.120000
Equipment	Hours			0.133900

Components in This Task: 0811200

TASK DATA FORM

Task Code: 0811205

Component: FLUSH-TANK WATER CLOSET System: SANITARY Subsystem: FIXTURES
Task Description: REPLACE REPLACE WATER CLOSET
Unit of Measure: COUNT Frequency of Occurrence: M: 26.00 A: 35.00 L: 44.00
Persons per Team: 2 Task Duration: 2.0360 hours Once every (M,A,L) years
Trade: PLUMBING Task Classification: 1

Labor Resources

Subtask Description	Labor Hrs
1.TURN WATER OFF AND ON	0.008000
2.REMOVE SEAT NUTS	0.021000
3.REMOVE SEAT	0.024000
4.DISCONNECT FLUSH PIPE	0.073000
5.DISCONNECT FEED LINE	0.011000
6.REMOVE LAG SCREWS	0.021000
7.REMOVE TANK FROM WALL	0.026000
8.REMOVE STOOL NUTS FROM BOLTS	0.043000
9.REMOVE BOWL	0.097000
10.BOLTS FROM RING	0.043000
11.REMOVE GASKET	0.023000
12.INSTALL NEW BOWL AND TANK	2.568000
13.MOVE MATERIAL	0.207000

Material Resources

Description	Quantity	Unit Cost
WATER CLOSET	1	74.5900
		74.5900

SUMMARY

Resources	UOM	Direct	Indirect	Total
Labor	Hours	3.103000	0.908900	4.111900
Material	Cost $	74.590000		74.590000
Equipment	Hours			2.055950

Components in This Task: 0811200

Table 5

Task Summary Data for a Flush Tank Water Closet

Caces	Description	UM	TRD	Class	High Freq	Ave Freq	Low Freq	Labor Hours	Material Costs	Equip. Hours
	081120 FLUSH TANK WATER CLOSET									
081120	UNPLUG CLOGGED LINE	1	3	0	3.00	5.00	7.00	1.582100	1.320000	1.582100
0811202	REPLACE WASHER IN BALL COCK	1	3	0	4.00	5.00	6.00	.187200	.170000	.187200
0811203	REPLACE WORN PARTS IN WATER CLOSET	1	3	0	13.00	15.00	17.00	1.210300	15.500000	1.210300
0811204	INSTALL GASKET IN SPUD CONNECTION	1	3	0	17.00	20.00	23.00	.133900	.120000	.133900
0811205	REPLACE WATER CLOSET	1	3	1	26.00	35.00	44.00	4.111900	74.590000	2.055950

Army Wide Task/Basic Task Structure List Tree id: BF Group id: B5

UM = Unit of Measure TRD = Trade Index Class = Task Classification TWPMTH = Task Work Performance Method

Table 6

Flush Tank Water Closet Spreadsheet - Labor Hours

Year	Task 1	Task 2	Task 3	Task 4	Task 5	Total	10%	P.W. LABOR
1						0.000000	0.7164	0.000000
2						0.000000	0.6512	0.000000
3						0.000000	0.5920	0.000000
4						0.000000	0.5382	0.000000
5	1.582100	0.187200				1.769300	0.4893	0.865718
6						0.000000	0.4448	0.000000
7						0.000000	0.4044	0.000000
8						0.000000	0.3676	0.000000
9						0.000000	0.3342	0.000000
10	1.582100	0.187200				1.769300	0.3038	0.537513
11						0.000000	0.2762	0.000000
12						0.000000	0.2511	0.000000
13						0.000000	0.2283	0.000000
14						0.000000	0.2075	0.000000
15	1.582100	0.187200	1.210300			2.979600	0.1886	0.561953
16						0.000000	0.1715	0.000000
17						0.000000	0.1559	0.000000
18						0.000000	0.1417	0.000000
19						0.000000	0.1288	0.000000
20	1.582100	0.187200		0.113900		1.883200	0.1171	0.220523
21						0.000000	0.1065	0.000000
22						0.000000	0.0968	0.000000
23						0.000000	0.0880	0.000000
24						0.000000	0.0800	0.000000
25	1.582100	0.187200				1.769300	0.0727	0.128628
							TOTAL	2.314335

4 DATA BASE APPLICATION EXAMPLES

If the analysis is to be performed is for a 25-year period for either a 7 or 10 percent discount factor (from Tables 7 and 8), the calculations described in this chapter have been simplified and published in the USACERL Special Report series titled *Building Maintenance and Repair Data for Life-Cycle Cost Analyses*. The procedure described in this chapter can be used for other analyses in which the period is less than 25 years and/or a discount rate other than 7 or 10 percent is specified.

Appendix A contains an index of components under the plumbing systems group. Major categories are:

080 Plumbing
081 Sanitary Fixtures
082 Rain Water
083 Special Plumbing Systems
084 Special Plumbing Fixtures

Disposal Costs/Retention Value

If retention value is to be considered, it should be expressed as a percentage of the initial cost. The present worth of this value can be subtracted from the final net present worth.

Example 1—20-Year Analysis

Develop 20-year cost data using a 10 percent rate for a flush tank water closet. Initial construction costs can be obtained from the District cost estimating office or from Means or Dodge. Labor and equipment rates are obtained from the installation DEH. The geographical location adjustment factor can be taken from AR 415-17 and the Engineering Improvement Recommendation System (EIRS) Bulletin which updates the data in the AR. Inflation factors can be obtained from the HQUSACE cost estimating office. Retention value of 0 is assumed.

Plumber labor rate	$12.50
Equipment rate	$2.60
Geographical location factor	1.10
Material time adjustment factor, 1988 to 1989	1.02
Initial cost	$130
Number of fixtures	10

Table 7

7 Percent Discount Factors From Date of Study*

Years from BOD		End of Year	Accumulated End of Year
1		0.9346	0.9346
2		0.8734	1.8080
3		0.8163	2.6243
4		0.7629	3.3872
5		0.7130	4.1002
6		0.6663	4.7665
7		0.6227	5.3893
8		0.5820	5.9713
9		0.5439	6.5152
10		0.5083	7.0236
11		0.4751	7.4987
12		0.4440	7.9427
13		0.4150	8.3576
14		0.3878	8.7455
15		0.3624	9.1079
16		0.3387	9.4466
17		0.3166	9.7632
18		0.2959	10.0591
19		0.2765	10.3356
20		0.2584	10.5940
21		0.2415	10.8355
22		0.2257	11.0612
23		0.2109	11.2722
24		0.1971	11.4693
25	(Retention value at end of 25th year)	0.1842	11.6536

*Date of Study (DOS) is the Beneficial Occupancy Date (BOD)

Table 8

10 Percent Discount Factors From Date of Study

Date of Study (DOS) Exactly 3 Years Before the Beneficial Occupancy Date (BOD)

Year from BOD	Factors		Accumulated Mid-Year
	Mid-Year	End of Year	
-2		0.9091	0.0
-1		0.8265	0.0
BOD 0		0.7513	0.0
1	0.7164		0.7164
2	0.6512		1.3676
3	0.5920		1.9596
4	0.5382		2.4978
5	0.4893		2.9871
6	0.4448		3.4319
7	0.4044		3.8362
8	0.3676		4.2038
9	0.3342		4.5380
10	0.3038		4.8418
11	0.2762		5.1180
12	0.2511		5.3691
13	0.2283		5.5973
14	0.2075		5.8048
15	0.1886		5.9935
16	0.1715		6.1650
17	0.1559		6.3209
18	0.1417		6.4626
19	0.1288		6.5914
20	0.1171		6.7086
21	0.1065		6.8150
22	0.0968		6.9118
23	0.0880		6.9998
24	0.0800		7.0799
25	0.0727		7.1526
Retention Value at End of 25th Year		0.0693	

Table 8 lists 10 percent discount present worth factors. These factors assume a 3-year lead time from the study date to the beneficial occupancy date. The calculation process is relatively simple. The resources shown in Table 2 are multiplied by the present worth factors in Table 8 and then totaled. The next step is to multiply the labor hours by the labor rate, the equipment hours by the equipment rate, and the material costs by the geographical location factor and the time adjustment factor. The three values are added to produce a final dollar per UM value as shown in Table 9. This rate is multiplied by the number of fixtures and added to the initial construction cost to obtain the life-cycle cost:

($38.49662 + $130.00) x 10 fixtures= $1684.97 [Eq1]

Example 2—Changed Study Date

Use the same data in example 1, except that the study date is only 2 years before the beneficial occupancy date. The present worth must be adjusted for one less year of discounting. The discount factor for 1 year is 1/(1.10), so the value calculated above must be multiplied by 1.10. The answer for a 2-year lead time is 1.10 x $1684.97 = $1853.47

Table 9

10 Percent Calculation Spreadsheet

Year	10% P.W.F.	P.W. Material Costs	P.W. Labor Hours	P.W. Equip. Hours
1	0.7164	0.00000	0.00000	0.00000
2	0.6512	0.00000	0.00000	0.00000
3	0.5920	0.00000	0.00000	0.00000
4	0.5382	0.00000	0.00000	0.00000
5	0.4893	0.77280	.87731	.87731
6	0.4448	0.00000	0.00000	0.00000
7	0.4044	0.00000	0.00000	0.00000
8	0.3676	0.00000	0.00000	0.00000
9	0.3342	0.00000	0.00000	0.00000
10	0.3038	0.47982	.53751	.53751
11	0.2762	0.00000	0.00000	0.00000
12	0.2511	0.00000	0.00000	0.00000
13	0.2283	0.00000	0.00000	0.00000
14	0.2075	0.00000	0.00000	0.00000
15	0.1886	3.39657	.56195	.56195
16	0.1715	0.00000	0.00000	0.00000
17	0.1559	0.00000	0.00000	0.00000
18	0.1417	0.00000	0.00000	0.00000
19	0.1288	0.00000	0.00000	0.00000
20	0.1171	0.18459	.22052	.22052
TOTAL =		4.83414	2.19729	2.19729
RATE		1.1	$12.50	$2.60
COST/FIXTURE		5.31755	27.46612	5.71295
		TOTAL COST/FIXTURE		38.49662

NOTE: All data from Table 2 have been multiplied by the present worth value in column 2 to give the present worth values for material, labor, and equipment.

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LIST OF ACRONYMS

ACE	Assistant Chief of Engineers
AMS	Army Management System
APC	Account Processing Code
AR	Army Regulation
ARR	Annual Requirements Report
ASTM	American Society for Testing and Materials
BLAST	Building Loads Analysis and System Thermodynamics
BMAR	Backlog of Maintenance and Repair
CA	Commercial Activities
CACES	Computer-Assisted Cost Estimating System
CONUS	Continental United States
DA	Department of the Army
DEH	Directorate of Engineering and Housing
DOD	Department of Defense
EA	Economic Analysis
EPS	Engineered Performance Standards
HQ-IFS	Headquarters - Integrated Facilities System
HQDA	Headquarters Department of the Army
IFS	Integrated Facilities System
IJO	Individual Job Order
LCC	Life-Cycle Cost
LCCID	Life-Cycle Cost in Design
M&R	Maintenance and Repair
MACOM	Major Command

MCA	Military Construction, Army
MRPM	Maintenance Resource Prediction Model
OCE	Office of the Chief of Engineers
PAVER	Pavement Maintenance Management System
PC	Personal Computer
PM	Preventive Maintenance
R&D	Research and Development
RAM	Random Access Memory
RMF	Recurring Maintenance Factor
RPI	Real Property Inventory
RPLANS	Real Property Planning System
RPMS	Real Property Management System
SO	Service Order
STANFINS	Standard Army Financial System
TB	Technical Bulletin
URR	Unconstrained Requirements Report
USACE	U.S. Army Corps of Engineers
USACERL	U.S. Army Construction Engineering Research Laboratory
USAEHSC	U.S. Army Engineering and Housing Support Center

APPENDIX A:

COMPONENT RESOURCE DATA BASE—DATA SHEETS

25 YEAR COMPONENT LISTING

Caces No.:081110-TANK-LESS WATER CLOSET

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.0000	0.0000	0.0000	1
0.0000	0.0000	0.0000	2
0.0000	0.0000	0.0000	3
0.0000	0.0000	0.0000	4
1.5821	1.3992	1.5821	5
0.0000	0.0000	0.0000	6
0.0000	0.0000	0.0000	7
0.0000	0.0000	0.0000	8
0.0000	0.0000	0.0000	9
1.6926	13.3772	1.6926	10
0.0000	0.0000	0.0000	11
0.0000	0.0000	0.0000	12
0.0000	0.0000	0.0000	13
0.0000	0.0000	0.0000	14
1.5821	1.3992	1.5821	15
0.0000	0.0000	0.0000	16
0.0000	0.0000	0.0000	17
0.0000	0.0000	0.0000	18
0.0000	0.0000	0.0000	19
1.6926	13.3772	1.6926	20
0.0000	0.0000	0.0000	21
0.0000	0.0000	0.0000	22
0.0000	0.0000	0.0000	23
0.0000	0.0000	0.0000	24
1.5821	1.3992	1.5821	25

Caces No.:081120-FLUSH-TANK WATER CLOSET

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
1.7693	1.5794	1.7693
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
1.7693	1.5794	1.7693
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
2.9796	18.0094	2.9796
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
1.9032	1.7066	1.9032
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
1.7693	1.5794	1.7693

Caces No.:081130-URINAL

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.0000	0.0000	0.0000	1
0.0000	0.0000	0.0000	2
0.0000	0.0000	0.0000	3
0.0000	0.0000	0.0000	4
2.4011	2.0352	2.4011	5
0.0000	0.0000	0.0000	6
0.1170	11.9780	0.1170	7
0.0000	0.0000	0.0000	8
0.0000	0.0000	0.0000	9
2.4011	2.0352	2.4011	10
0.0000	0.0000	0.0000	11
0.0000	0.0000	0.0000	12
0.0000	0.0000	0.0000	13
0.1170	11.9780	0.1170	14
2.4011	2.0352	2.4011	15
0.0000	0.0000	0.0000	16
0.0000	0.0000	0.0000	17
0.0000	0.0000	0.0000	18
0.0000	0.0000	0.0000	19
2.4011	2.0352	2.4011	20
0.1170	11.9780	0.1170	21
0.0000	0.0000	0.0000	22
0.0000	0.0000	0.0000	23
0.0000	0.0000	0.0000	24
2.4011	2.0352	2.4011	25

Caces No.:081140-LAVATORY, IRON, ENAMEL

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.1339	0.1272	0.1339
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
1.6419	35.4252	1.6419
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
0.7605	0.8480	0.7605
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
1.6419	35.4252	1.6419
0.1339	0.1272	0.1339
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000

Caces No.:081150-LAVATORY, VITREOUS CHINA

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.0000	0.0000	0.0000	1
0.6266	0.7208	0.6266	2
0.0000	0.0000	0.0000	3
0.6266	0.7208	0.6266	4
0.0000	0.0000	0.0000	5
0.6266	0.7208	0.6266	6
0.1339	0.1272	0.1339	7
0.6266	0.7208	0.6266	8
0.0000	0.0000	0.0000	9
1.6419	35.4252	1.6419	10
0.0000	0.0000	0.0000	11
0.6266	0.7208	0.6266	12
0.0000	0.0000	0.0000	13
0.7605	0.8480	0.7605	14
0.0000	0.0000	0.0000	15
0.6266	0.7208	0.6266	16
0.0000	0.0000	0.0000	17
0.6266	0.7208	0.6266	18
0.0000	0.0000	0.0000	19
1.6419	35.4252	1.6419	20
0.1339	0.1272	0.1339	21
0.6266	0.7208	0.6266	22
0.0000	0.0000	0.0000	23
0.6266	0.7208	0.6266	24
0.0000	0.0000	0.0000	25

Caces No.:081160-LAVATORY, ENAMELED STEEL

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.1339	0.1272	0.1339
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
1.6432	35.4252	1.6432
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
0.7605	0.8480	0.7605
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
1.6432	35.4252	1.6432
0.1339	0.1272	0.1339
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000

25 YEAR COMPONENT LISTING

Caces No.:081170-BATHTUB, CAST IRON ENAMEL

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.0000	0.0000	0.0000	1
0.1443	0.1484	0.1443	2
0.1157	0.1431	0.1157	3
1.1713	13.3984	1.1713	4
0.7670	0.7632	0.7670	5
0.8320	0.8639	0.8320	6
0.0000	0.0000	0.0000	7
1.1713	13.3984	1.1713	8
0.1157	0.1431	0.1157	9
1.7290	49.6716	1.7290	10
0.0000	0.0000	0.0000	11
1.8590	14.1139	1.8590	12
0.0000	0.0000	0.0000	13
0.1443	0.1484	0.1443	14
0.8827	0.9063	0.8827	15
1.1713	13.3984	1.1713	16
0.0000	0.0000	0.0000	17
0.8320	0.8639	0.8320	18
0.0000	0.0000	0.0000	19
2.7560	62.9216	2.7560	20
0.1157	0.1431	0.1157	21
0.1443	0.1484	0.1443	22
0.0000	0.0000	0.0000	23
1.8590	14.1139	1.8590	24
0.7670	0.7632	0.7670	25

Caces No.:081180-BATHTUB, ENAMELED STEEL

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.7163	0.7208	0.7163
0.1157	0.1166	0.1157
1.7433	13.9708	1.7433
0.7670	0.7632	0.7670
0.8320	0.8374	0.8320
0.0000	0.0000	0.0000
1.7433	13.9708	1.7433
0.1157	0.1166	0.1157
2.3010	50.2440	2.3010
0.0000	0.0000	0.0000
1.8590	14.0874	1.8590
0.0000	0.0000	0.0000
0.7163	0.7208	0.7163
0.8827	0.8798	0.8827
1.7433	13.9708	1.7433
0.0000	0.0000	0.0000
0.8320	0.8374	0.8320
0.0000	0.0000	0.0000
3.3280	63.4940	3.3280
0.1157	0.1166	0.1157
0.7163	0.7208	0.7163
0.0000	0.0000	0.0000
1.8590	14.0874	1.8590
0.7670	0.7632	0.7670

Caces No.:081190-SHOWER, TERRAZO

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.0000	0.0000	0.0000	1
0.7163	0.7208	0.7163	2
0.1157	0.1431	0.1157	3
0.7163	0.7208	0.7163	4
0.7670	0.7632	0.7670	5
0.8320	0.8639	0.8320	6
0.0000	0.0000	0.0000	7
0.7163	0.7208	0.7163	8
0.1157	0.1431	0.1157	9
2.3010	50.2440	2.3010	10
0.0000	0.0000	0.0000	11
0.8320	0.8639	0.8320	12
0.0000	0.0000	0.0000	13
0.7163	0.7208	0.7163	14
0.8827	0.9063	0.8827	15
0.7163	0.7208	0.7163	16
0.0000	0.0000	0.0000	17
0.8320	0.8639	0.8320	18
0.0000	0.0000	0.0000	19
2.3010	50.2440	2.3010	20
0.1157	0.1431	0.1157	21
0.7163	0.7208	0.7163	22
0.0000	0.0000	0.0000	23
0.8320	0.8639	0.8320	24
0.7670	0.7632	0.7670	25

Caces No.:0811A0-SHOWER, ENAMELED STEEL

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.7163	0.7208	0.7163
0.1157	0.1431	0.1157
0.7163	0.7208	0.7163
0.7670	0.7632	0.7670
0.8320	0.8639	0.8320
0.0000	0.0000	0.0000
0.7163	0.7208	0.7163
0.1157	0.1431	0.1157
2.3010	50.2440	2.3010
0.0000	0.0000	0.0000
0.8320	0.8639	0.8320
0.0000	0.0000	0.0000
0.7163	0.7208	0.7163
0.8827	0.9063	0.8827
0.7163	0.7208	0.7163
0.0000	0.0000	0.0000
0.8320	0.8639	0.8320
0.0000	0.0000	0.0000
2.3010	50.2440	2.3010
0.1157	0.1431	0.1157
0.7163	0.7208	0.7163
0.0000	0.0000	0.0000
0.8320	0.8639	0.8320
0.7670	0.7632	0.7670

Caces No.:0811B0-SHOWER, PLASTIC

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.0000	0.0000	0.0000	1
0.7163	0.7208	0.7163	2
0.1157	0.1431	0.1157	3
0.7163	0.7208	0.7163	4
0.7670	0.7632	0.7670	5
0.8320	0.8639	0.8320	6
0.0000	0.0000	0.0000	7
0.7163	0.7208	0.7163	8
0.1157	0.1431	0.1157	9
2.3010	50.2440	2.3010	10
0.0000	0.0000	0.0000	11
0.8320	0.8639	0.8320	12
0.0000	0.0000	0.0000	13
0.7163	0.7208	0.7163	14
0.8827	0.9063	0.8827	15
0.7163	0.7208	0.7163	16
0.0000	0.0000	0.0000	17
0.8320	0.8639	0.8320	18
0.0000	0.0000	0.0000	19
3.3670	105.9894	1.6835	20
0.0000	0.0000	0.0000	21
0.7163	0.7208	0.7163	22
0.1157	0.1431	0.1157	23
0.7163	0.7208	0.7163	24
0.7670	0.7632	0.7670	25

Caces No.:0811C0-SHOWER, ALUMINUM

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.7176	0.7208	0.7176
0.1157	0.1431	0.1157
0.7176	0.7208	0.7176
0.7670	0.7632	0.7670
0.8333	0.8639	0.8333
0.0000	0.0000	0.0000
0.7176	0.7208	0.7176
0.1157	0.1431	0.1157
2.3023	50.2440	2.3023
0.0000	0.0000	0.0000
0.8333	0.8639	0.8333
0.0000	0.0000	0.0000
0.7176	0.7208	0.7176
0.8827	0.9063	0.8827
0.7176	0.7208	0.7176
0.0000	0.0000	0.0000
0.8333	0.8639	0.8333
0.0000	0.0000	0.0000
2.3023	50.2440	2.3023
0.1157	0.1431	0.1157
0.7176	0.7208	0.7176
0.0000	0.0000	0.0000
0.8333	0.8639	0.8333
3.3670	179.6700	1.6835

25 YEAR COMPONENT LISTING

Caces No.:0811D0-SINK, IRON ENAMEL

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.0000	0.0000	0.0000	1
0.7163	0.7208	0.7163	2
0.1664	0.2862	0.1664	3
0.7163	0.7208	0.7163	4
0.0000	0.0000	0.0000	5
0.8827	1.0070	0.8827	6
0.0000	0.0000	0.0000	7
1.8863	1.8868	1.8863	8
0.1664	0.2862	0.1664	9
1.5340	38.8808	1.5340	10
0.0000	0.0000	0.0000	11
0.8827	1.0070	0.8827	12
0.0000	0.0000	0.0000	13
0.7163	0.7208	0.7163	14
0.1664	0.2862	0.1664	15
1.8863	1.8868	1.8863	16
0.0000	0.0000	0.0000	17
0.8827	1.0070	0.8827	18
0.0000	0.0000	0.0000	19
1.5340	38.8808	1.5340	20
0.1664	0.2862	0.1664	21
0.7163	0.7208	0.7163	22
0.0000	0.0000	0.0000	23
2.0527	2.1730	2.0527	24
0.0000	0.0000	0.0000	25

Caces No.:0811E0-SINK, ENAMELED STEEL

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.7163	0.7208	0.7163
0.1677	0.2862	0.1677
0.7163	0.7208	0.7163
0.0000	0.0000	0.0000
0.8840	1.0070	0.8840
0.0000	0.0000	0.0000
1.8863	1.8868	1.8863
0.1677	0.2862	0.1677
1.5340	38.8808	1.5340
0.0000	0.0000	0.0000
0.8840	1.0070	0.8840
0.0000	0.0000	0.0000
0.7163	0.7208	0.7163
0.1677	0.2862	0.1677
1.8863	1.8868	1.8863
0.0000	0.0000	0.0000
0.8840	1.0070	0.8840
0.0000	0.0000	0.0000
1.5340	38.8808	1.5340
0.1677	0.2862	0.1677
0.7163	0.7208	0.7163
0.0000	0.0000	0.0000
2.0540	2.1730	2.0540
0.0000	0.0000	0.0000

Caces No.:0811F0-SINK, STAINLESS STEEL

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.0000	0.0000	0.0000	1
0.7176	0.7208	0.7176	2
0.1677	0.2862	0.1677	3
0.7176	0.7208	0.7176	4
0.0000	0.0000	0.0000	5
0.8853	1.0070	0.8853	6
0.0000	0.0000	0.0000	7
1.8876	1.8868	1.8876	8
0.1677	0.2862	0.1677	9
1.5353	45.2408	1.5353	10
0.0000	0.0000	0.0000	11
0.8853	1.0070	0.8853	12
0.0000	0.0000	0.0000	13
0.7176	0.7208	0.7176	14
0.1677	0.2862	0.1677	15
1.8876	1.8868	1.8876	16
0.0000	0.0000	0.0000	17
0.8853	1.0070	0.8853	18
0.0000	0.0000	0.0000	19
1.5353	45.2408	1.5353	20
0.1677	0.2862	0.1677	21
0.7176	0.7208	0.7176	22
0.0000	0.0000	0.0000	23
2.0553	2.1730	2.0553	24
0.0000	0.0000	0.0000	25

Caces No.:0811G0-SINK, PLASTIC

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.7163	0.7208	0.7163
0.1677	0.2862	0.1677
0.7163	0.7208	0.7163
0.0000	0.0000	0.0000
0.8840	1.0070	0.8840
0.0000	0.0000	0.0000
1.8863	1.8868	1.8863
0.1677	0.2862	0.1677
1.5340	38.8808	1.5340
0.0000	0.0000	0.0000
0.8840	1.0070	0.8840
0.0000	0.0000	0.0000
0.7163	0.7208	0.7163
2.8340	63.0806	1.4170
0.0000	0.0000	0.0000
0.7163	0.7208	0.7163
0.1677	0.2862	0.1677
0.7163	0.7208	0.7163
0.0000	0.0000	0.0000
0.8840	1.0070	0.8840
0.0000	0.0000	0.0000
1.5340	38.8808	1.5340
0.1677	0.2862	0.1677
0.7163	0.7208	0.7163
0.0000	0.0000	0.0000
2.0540	2.1730	2.0540
0.0000	0.0000	0.0000

Caces No.:0811H0-DRINKING FOUNTAIN

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.6760	0.8480	0.6760	1
2.3660	2.2345	2.3660	2
0.6760	0.8480	0.6760	3
4.1340	4.4393	4.1340	4
0.6760	0.8480	0.6760	5
2.3660	2.2345	2.3660	6
0.6760	0.8480	0.6760	7
4.1340	4.4393	4.1340	8
0.6760	0.8480	0.6760	9
1.3780	496.3980	0.6890	10
0.6760	0.8480	0.6760	11
2.3660	2.2345	2.3660	12
0.6760	0.8480	0.6760	13
4.1340	4.4393	4.1340	14
0.6760	0.8480	0.6760	15
2.3660	2.2345	2.3660	16
0.6760	0.8480	0.6760	17
4.1340	4.4393	4.1340	18
0.6760	0.8480	0.6760	19
1.3780	496.3980	0.6890	20
0.6760	0.8480	0.6760	21
2.3660	2.2345	2.3660	22
0.6760	0.8480	0.6760	23
4.1340	4.4393	4.1340	24
0.6760	0.8480	0.6760	25

Caces No.:0811I0-SPIGOT

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.3367	0.4452	0.3367
0.0000	0.0000	0.0000
0.3367	0.4452	0.3367
0.0000	0.0000	0.0000
0.3367	0.4452	0.3367
0.0000	0.0000	0.0000
0.3367	0.4452	0.3367
0.0000	0.0000	0.0000
0.2600	5.5120	0.2600
0.0000	0.0000	0.0000
0.3367	0.4452	0.3367
0.0000	0.0000	0.0000
0.3367	0.4452	0.3367
0.0000	0.0000	0.0000
0.3367	0.4452	0.3367
0.0000	0.0000	0.0000
0.3367	0.4452	0.3367
0.0000	0.0000	0.0000
0.2600	5.5120	0.2600
0.0000	0.0000	0.0000
0.3367	0.4452	0.3367
0.0000	0.0000	0.0000
0.3367	0.4452	0.3367
0.0000	0.0000	0.0000

25 YEAR COMPONENT LISTING

Caces No.:0811J0-BATHTUB, PLASTIC

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.0000	0.0000	0.0000	1
0.1443	0.1484	0.1443	2
0.1157	0.1431	0.1157	3
1.1713	13.3984	1.1713	4
0.7670	0.7632	0.7670	5
0.8320	0.8639	0.8320	6
0.0000	0.0000	0.0000	7
1.1713	13.3984	1.1713	8
0.1157	0.1431	0.1157	9
1.7290	49.6716	1.7290	10
0.0000	0.0000	0.0000	11
1.8590	14.1139	1.8590	12
0.0000	0.0000	0.0000	13
0.1443	0.1484	0.1443	14
0.8827	0.9063	0.8827	15
1.1713	13.3984	1.1713	16
0.0000	0.0000	0.0000	17
0.8320	0.8639	0.8320	18
0.0000	0.0000	0.0000	19
13.0000	443.6100	6.5000	20
0.0000	0.0000	0.0000	21
0.1443	0.1484	0.1443	22
0.1157	0.1431	0.1157	23
1.1713	13.3984	1.1713	24
0.7670	0.7632	0.7670	25

Caces No.:0811K0-LAVATORY, PLASTIC

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.1339	0.1272	0.1339
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
1.6367	35.4252	1.6367
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
0.7605	0.8480	0.7605
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
1.9968	77.3800	0.9984
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000
0.6266	0.7208	0.6266
0.0000	0.0000	0.0000

Caces No.:0811L0-EMERGENCY SHOWER STATION

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.0000	0.0000	0.0000	1
0.0000	0.0000	0.0000	2
0.1157	0.1431	0.1157	3
0.0000	0.0000	0.0000	4
0.0000	0.0000	0.0000	5
0.1157	0.1431	0.1157	6
0.0000	0.0000	0.0000	7
0.0000	0.0000	0.0000	8
0.1157	0.1431	0.1157	9
0.3536	0.4452	0.3536	10
0.0000	0.0000	0.0000	11
0.1157	0.1431	0.1157	12
0.0000	0.0000	0.0000	13
0.0000	0.0000	0.0000	14
0.1157	0.1431	0.1157	15
0.0000	0.0000	0.0000	16
0.0000	0.0000	0.0000	17
0.1157	0.1431	0.1157	18
0.0000	0.0000	0.0000	19
0.3536	0.4452	0.3536	20
0.1157	0.1431	0.1157	21
0.0000	0.0000	0.0000	22
0.0000	0.0000	0.0000	23
0.1157	0.1431	0.1157	24
2.6000	143.1000	1.3000	25

Caces No.:0811M0-EMERGENCY EYE WASH

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.1157	0.1431	0.1157
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.1157	0.1431	0.1157
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.1157	0.1431	0.1157
0.3536	0.4452	0.3536
0.0000	0.0000	0.0000
0.1157	0.1431	0.1157
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.1157	0.1431	0.1157
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.1157	0.1431	0.1157
0.0000	0.0000	0.0000
0.3536	0.4452	0.3536
0.1157	0.1431	0.1157
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.1157	0.1431	0.1157
2.6000	110.2400	1.3000

Caces No.:0811N0-SHOWER, CMU

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.0000	0.0000	0.0000	1
0.7163	0.7208	0.7163	2
0.1157	0.1431	0.1157	3
0.7163	0.7208	0.7163	4
0.7670	0.7632	0.7670	5
0.8320	0.8639	0.8320	6
0.0000	0.0000	0.0000	7
0.7163	0.7208	0.7163	8
0.1157	0.1431	0.1157	9
2.3010	50.2440	2.3010	10
0.0000	0.0000	0.0000	11
0.8320	0.8639	0.8320	12
0.0000	0.0000	0.0000	13
0.7163	0.7208	0.7163	14
0.8827	0.9063	0.8827	15
0.7163	0.7208	0.7163	16
0.0000	0.0000	0.0000	17
0.8320	0.8639	0.8320	18
0.0000	0.0000	0.0000	19
98.9170	212.0000	49.4585	20
0.0000	0.0000	0.0000	21
0.7163	0.7208	0.7163	22
0.1157	0.1431	0.1157	23
0.7163	0.7208	0.7163	24
0.7670	0.7632	0.7670	25

Caces No.:0811P0-SHOWER GLAZED CMU

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.7163	0.7208	0.7163
0.1157	0.1431	0.1157
0.7163	0.7208	0.7163
0.7670	0.7632	0.7670
0.8320	0.8639	0.8320
0.0000	0.0000	0.0000
0.7163	0.7208	0.7163
0.1157	0.1431	0.1157
2.3010	50.2440	2.3010
0.0000	0.0000	0.0000
0.8320	0.8639	0.8320
0.0000	0.0000	0.0000
0.7163	0.7208	0.7163
0.8827	0.9063	0.8827
0.7163	0.7208	0.7163
0.0000	0.0000	0.0000
0.8320	0.8639	0.8320
0.0000	0.0000	0.0000
2.3010	50.2440	2.3010
0.1157	0.1431	0.1157
0.7163	0.7208	0.7163
0.0000	0.0000	0.0000
0.8320	0.8639	0.8320
98.9170	238.5000	49.4585

25 YEAR COMPONENT LISTING

Caces No.:0811R0-SHOWER, CERAMIC TILE — 081210-PIPE & FITTINGS,C.I.

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR	LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000	1	0.0000	0.0000	0.0000
0.7163	0.7208	0.7163	2	0.0000	0.0000	0.0000
0.1157	0.1431	0.1157	3	0.0000	0.0000	0.0000
0.7163	0.7208	0.7163	4	0.0000	0.0000	0.0000
0.7670	0.7632	0.7670	5	0.0000	0.0000	0.0000
0.8320	0.8639	0.8320	6	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	7	0.0000	0.0000	0.0000
0.7163	0.7208	0.7163	8	0.0000	0.0000	0.0000
0.1157	0.1431	0.1157	9	0.0000	0.0000	0.0000
2.3010	50.2440	2.3010	10	0.8190	4.0704	0.8190
0.0000	0.0000	0.0000	11	0.0000	0.0000	0.0000
0.8320	0.8639	0.8320	12	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	13	0.0000	0.0000	0.0000
0.7163	0.7208	0.7163	14	0.0000	0.0000	0.0000
0.8827	0.9063	0.8827	15	0.0000	0.0000	0.0000
0.7163	0.7208	0.7163	16	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	17	0.0000	0.0000	0.0000
0.8320	0.8639	0.8320	18	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	19	0.0000	0.0000	0.0000
2.3010	50.2440	2.3010	20	6.0190	29.5104	6.0190
0.1157	0.1431	0.1157	21	0.0000	0.0000	0.0000
0.7163	0.7208	0.7163	22	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	23	0.0000	0.0000	0.0000
0.8320	0.8639	0.8320	24	0.0000	0.0000	0.0000
0.7670	0.7632	0.7670	25	0.0000	0.0000	0.0000

Caces No.:081220-FLOOR DRAIN, W/O BUCKET — 081230-FLOOR DRAIN WITH BUCKET

0.0000	0.0000	0.0000	1	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	2	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	3	0.0000	0.0000	0.0000
2.0670	0.0000	2.0670	4	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	5	3.8740	0.0000	3.8740
0.0000	0.0000	0.0000	6	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	7	0.0000	0.0000	0.0000
2.0670	0.0000	2.0670	8	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	9	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	10	3.8740	0.0000	3.8740
0.0000	0.0000	0.0000	11	0.0000	0.0000	0.0000
2.0670	0.0000	2.0670	12	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	13	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	14	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	15	3.8740	0.0000	3.8740
2.0670	0.0000	2.0670	16	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	17	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	18	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	19	0.0000	0.0000	0.0000
2.6390	0.5724	2.6390	20	4.4460	0.2862	4.4460
0.0000	0.0000	0.0000	21	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	22	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	23	0.0000	0.0000	0.0000
2.0670	0.0000	2.0670	24	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	25	3.8740	0.0000	3.8740

Caces No.:081240-PIPE AND FITTINGS, PVC — 081310-PIPE/FITTINGS, STEEL/IRON

0.0000	0.0000	0.0000	1	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	2	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	3	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	4	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	5	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	6	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	7	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	8	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	9	0.0000	0.0000	0.0000
0.8190	4.0704	0.8190	10	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	11	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	12	10.7445	19.2920	5.3723
0.0000	0.0000	0.0000	13	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	14	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	15	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	16	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	17	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	18	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	19	0.0000	0.0000	0.0000
6.0190	29.5104	6.0190	20	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	21	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	22	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	23	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	24	10.7445	19.2920	5.3723
241.8000	8034.8000	120.9000	25	0.0000	0.0000	0.0000

25 YEAR COMPONENT LISTING

Caces No.:081320-PIPE/FITTINGS, COPPER — 081330-VALVE, NON-DRAIN,<1 1/2"

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR	LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000	1	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	2	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	3	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	4	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	5	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	6	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	7	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	8	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	9	0.0000	0.0000	0.0000
0.1846	0.0348	0.1846	10	0.3536	0.4452	0.3536
0.0000	0.0000	0.0000	11	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	12	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	13	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	14	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	15	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	16	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	17	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	18	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	19	0.0000	0.0000	0.0000
5.7356	11.2148	2.9601	20	0.2600	11.0240	0.2600
0.0000	0.0000	0.0000	21	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	22	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	23	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	24	0.0000	0.0000	0.0000
55.5100	1113.0000	27.7550	25	0.0000	0.0000	0.0000

Caces No.:081340-VALVE, NON-DRAIN, 2"- 3" — 081350-VALVE, NON-DRAIN, 4"- 6"

0.0000	0.0000	0.0000	1	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	2	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	3	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	4	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	5	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	6	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	7	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	8	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	9	0.6331	0.6678	0.6331
0.3549	0.8904	0.3549	10	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	11	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	12	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	13	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	14	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	15	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	16	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	17	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	18	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	19	0.6331	0.6678	0.6331
0.5720	75.9702	0.5720	20	3.9000	125.4298	1.9500
0.0000	0.0000	0.0000	21	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	22	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	23	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	24	0.6331	0.6678	0.6331
0.0000	0.0000	0.0000	25	0.6331	0.6678	0.6331

Caces No.:081360-VALVE, DRAIN — 081370-EXPANSION CHAMBER

0.0000	0.0000	0.0000	1	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	2	0.0000	0.0000	0.0000
0.3549	0.3339	0.3549	3	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	4	0.0000	0.0000	0.0000
0.3549	0.3339	0.3549	5	0.0390	0.0000	0.0390
0.0000	0.0000	0.0000	6	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	7	0.0000	0.0000	0.0000
0.4108	6.1639	0.4108	8	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	9	0.0000	0.0000	0.0000
0.3549	0.3339	0.3549	10	1.2740	208.4914	1.2740
0.0000	0.0000	0.0000	11	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	12	0.0000	0.0000	0.0000
0.3549	0.3339	0.3549	13	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	14	0.0000	0.0000	0.0000
0.4108	6.1639	0.4108	15	0.0390	0.0000	0.0390
0.0000	0.0000	0.0000	16	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	17	0.0000	0.0000	0.0000
0.3549	0.3339	0.3549	18	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	19	0.0000	0.0000	0.0000
0.5070	20.2248	0.5070	20	1.2740	208.4914	1.2740
0.0000	0.0000	0.0000	21	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	22	0.0000	0.0000	0.0000
0.3549	0.3339	0.3549	23	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	24	0.0000	0.0000	0.0000
0.3549	0.3339	0.3549	25	0.0390	0.0000	0.0390

25 YEAR COMPONENT LISTING

Caces No.:081380-WATER METER

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.0000	0.0000	0.0000	1
0.0000	0.0000	0.0000	2
0.0000	0.0000	0.0000	3
0.0000	0.0000	0.0000	4
0.0000	0.0000	0.0000	5
0.0000	0.0000	0.0000	6
0.0000	0.0000	0.0000	7
0.0000	0.0000	0.0000	8
0.0000	0.0000	0.0000	9
0.0000	0.0000	0.0000	10
0.0000	0.0000	0.0000	11
0.0000	0.0000	0.0000	12
1.3000	3.2330	1.3000	13
0.0000	0.0000	0.0000	14
0.0000	0.0000	0.0000	15
0.0000	0.0000	0.0000	16
0.0000	0.0000	0.0000	17
0.0000	0.0000	0.0000	18
0.0000	0.0000	0.0000	19
0.0000	0.0000	0.0000	20
0.0000	0.0000	0.0000	21
0.0000	0.0000	0.0000	22
0.0000	0.0000	0.0000	23
0.0000	0.0000	0.0000	24
0.7930	86.4748	0.7930	25

Caces No.:081390-INSULATION, PIPE

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.3380	0.4240	0.3380
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.3380	0.4240	0.3380
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
31.4990	678.4000	31.4990
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.3380	0.4240	0.3380
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.3380	0.4240	0.3380

Caces No.:0813A0-CIRC. PUMP - 1/8 HP.

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.1092	0.2756	0.1092	1
0.1092	0.2756	0.1092	2
0.1092	0.2756	0.1092	3
0.1092	0.2756	0.1092	4
0.1092	0.2756	0.1092	5
0.1092	0.2756	0.1092	6
0.1092	0.2756	0.1092	7
0.1092	0.2756	0.1092	8
0.1092	0.2756	0.1092	9
0.7124	1.7596	0.7124	10
0.1092	0.2756	0.1092	11
0.1092	0.2756	0.1092	12
0.1092	0.2756	0.1092	13
0.1092	0.2756	0.1092	14
0.1092	0.2756	0.1092	15
0.1092	0.2756	0.1092	16
0.1092	0.2756	0.1092	17
0.1092	0.2756	0.1092	18
0.1092	0.2756	0.1092	19
1.0790	212.0000	0.5395	20
0.1092	0.2756	0.1092	21
0.1092	0.2756	0.1092	22
0.1092	0.2756	0.1092	23
0.1092	0.2756	0.1092	24
0.1092	0.2756	0.1092	25

Caces No.:0813B0-CIRC. PUMP - 1/6 HP.

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.1092	0.2756	0.1092
0.1092	0.2756	0.1092
0.1092	0.2756	0.1092
0.7111	2.0564	0.7111
0.1092	0.2756	0.1092
0.1092	0.2756	0.1092
0.1092	0.2756	0.1092
0.7111	2.0564	0.7111
0.1092	0.2756	0.1092
0.1092	0.2756	0.1092
0.1092	0.2756	0.1092
0.7111	2.0564	0.7111
0.1092	0.2756	0.1092
0.1092	0.2756	0.1092
0.1092	0.2756	0.1092
0.1092	0.2756	0.1092
0.7111	2.0564	0.7111
0.1092	0.2756	0.1092
0.1092	0.2756	0.1092
0.1092	0.2756	0.1092
1.8460	371.0000	0.9230
0.1092	0.2756	0.1092
0.1092	0.2756	0.1092
0.1092	0.2756	0.1092
0.7111	2.0564	0.7111
0.1092	0.2756	0.1092

Caces No.:0813C0-CIRC. PUMP - 1/2 HP.

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.1625	0.2756	0.1625	1
0.1625	0.2756	0.1625	2
0.1625	0.2756	0.1625	3
0.1625	0.2756	0.1625	4
1.0491	3.0316	1.0491	5
0.1625	0.2756	0.1625	6
0.1625	0.2756	0.1625	7
0.1625	0.2756	0.1625	8
0.1625	0.2756	0.1625	9
1.0491	3.0316	1.0491	10
0.1625	0.2756	0.1625	11
0.1625	0.2756	0.1625	12
0.1625	0.2756	0.1625	13
0.1625	0.2756	0.1625	14
1.0491	3.0316	1.0491	15
0.1625	0.2756	0.1625	16
0.1625	0.2756	0.1625	17
0.1625	0.2756	0.1625	18
0.1625	0.2756	0.1625	19
2.8730	116.6000	1.4365	20
0.1625	0.2756	0.1625	21
0.1625	0.2756	0.1625	22
0.1625	0.2756	0.1625	23
0.1625	0.2756	0.1625	24
1.0491	3.0316	1.0491	25

Caces No.:0813D0-PIPE/FITTINGS, PVC

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.2870	0.0265	0.2870
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.7041	6.7575	0.4955
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000

25 YEAR COMPONENT LISTING

Caces No.:0813E0-HOSE BIBB — 0813F0-CIRC. PUMP > 1 HP

0813E0 LABOR HOURS	0813E0 MATERIALS $	0813E0 EQUIPMENT HOURS	YR	0813F0 LABOR HOURS	0813F0 MATERIALS $	0813F0 EQUIPMENT HOURS
0.0000	0.0000	0.0000	1	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	2	0.1625	0.5512	0.1625
0.3536	0.4452	0.3536	3	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	4	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	5	1.0491	3.3072	1.0491
0.3536	0.4452	0.3536	6	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	7	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	8	0.1625	0.5512	0.1625
0.3536	0.4452	0.3536	9	0.1625	0.5512	0.1625
0.2600	5.5120	0.2600	10	1.0491	3.3072	1.0491
0.0000	0.0000	0.0000	11	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	12	0.1625	0.5512	0.1625
0.3536	0.4452	0.3536	13	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	14	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	15	1.0491	3.3072	1.0491
0.3536	0.4452	0.3536	16	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	17	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	18	0.1625	0.5512	0.1625
0.3536	0.4452	0.3536	19	0.1625	0.5512	0.1625
0.2600	5.5120	0.2600	20	2.8730	116.6000	1.4365
0.0000	0.0000	0.0000	21	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	22	0.1625	0.5512	0.1625
0.3536	0.4452	0.3536	23	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	24	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	25	1.0491	3.3072	1.0491

Caces No.:081410-PIPE/FITTINGS, STEEL/IRON — 081420-PIPE/FITTINGS, COPPER

081410 LABOR HOURS	081410 MATERIALS $	081410 EQUIPMENT HOURS	YR	081420 LABOR HOURS	081420 MATERIALS $	081420 EQUIPMENT HOURS
0.0000	0.0000	0.0000	1	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	2	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	3	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	4	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	5	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	6	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	7	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	8	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	9	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	10	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	11	0.0000	0.0000	0.0000
10.7445	19.2920	5.3723	12	5.5510	11.1300	2.7755
0.0000	0.0000	0.0000	13	0.1846	0.0848	0.1846
0.0000	0.0000	0.0000	14	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	15	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	16	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	17	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	18	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	19	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	20	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	21	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	22	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	23	0.0000	0.0000	0.0000
10.7445	19.2920	5.3723	24	5.5510	11.1300	2.7755
0.3250	0.1696	0.3250	25	55.5100	1113.0000	27.7550

Caces No.:081430-VALVE, NON-DRAIN,<1-1/2" — 081440-VALVE, NON-DRAIN, 2"- 3"

081430 LABOR HOURS	081430 MATERIALS $	081430 EQUIPMENT HOURS	YR	081440 LABOR HOURS	081440 MATERIALS $	081440 EQUIPMENT HOURS
0.0000	0.0000	0.0000	1	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	2	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	3	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	4	0.0000	0.0000	0.0000
0.3536	0.4452	0.3536	5	0.3536	0.8904	0.3536
0.0000	0.0000	0.0000	6	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	7	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	8	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	9	0.0000	0.0000	0.0000
0.2600	11.0240	0.2600	10	0.5720	75.9702	0.5720
0.0000	0.0000	0.0000	11	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	12	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	13	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	14	0.0000	0.0000	0.0000
0.3536	0.4452	0.3536	15	0.3536	0.8904	0.3536
0.0000	0.0000	0.0000	16	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	17	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	18	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	19	0.0000	0.0000	0.0000
0.2600	11.0240	0.2600	20	0.5720	75.9702	0.5720
0.0000	0.0000	0.0000	21	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	22	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	23	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	24	0.0000	0.0000	0.0000
0.3536	0.4452	0.3536	25	0.3536	0.8904	0.3536

25 YEAR COMPONENT LISTING

Caces No.:081450-VALVE, NON-DRAIN, 4"- 6"

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.6331	0.6678	0.6331	1
0.6331	0.6678	0.6331	2
0.6331	0.6678	0.6331	3
0.6331	0.6678	0.6331	4
0.6331	0.6678	0.6331	5
0.6331	0.6678	0.6331	6
0.6331	0.6678	0.6331	7
0.6331	0.6678	0.6331	8
0.6331	0.6678	0.6331	9
3.9000	125.4298	1.9500	10
0.6331	0.6678	0.6331	11
0.6331	0.6678	0.6331	12
0.6331	0.6678	0.6331	13
0.6331	0.6678	0.6331	14
0.6331	0.6678	0.6331	15
0.6331	0.6678	0.6331	16
0.6331	0.6678	0.6331	17
0.6331	0.6678	0.6331	18
0.6331	0.6678	0.6331	19
3.9000	125.4298	1.9500	20
0.6331	0.6678	0.6331	21
0.6331	0.6678	0.6331	22
0.6331	0.6678	0.6331	23
0.6331	0.6678	0.6331	24
0.6331	0.6678	0.6331	25

081460-VALVE, DRAIN

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.3536	0.3339	0.3536
0.0559	5.8300	0.0559
0.3536	0.3339	0.3536
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.4095	6.1639	0.4095
0.0000	0.0000	0.0000
0.5070	20.2248	0.5070
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.3536	0.3339	0.3536
0.0559	5.8300	0.0559
0.3536	0.3339	0.3536
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.4095	6.1639	0.4095
0.0000	0.0000	0.0000
0.5070	20.2248	0.5070
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.3536	0.3339	0.3536
0.0559	5.8300	0.0559
0.3536	0.3339	0.3536

Caces No.:081470-EXPANSION CHAMBER

0.0000	0.0000	0.0000	1
0.0000	0.0000	0.0000	2
0.0000	0.0000	0.0000	3
0.0000	0.0000	0.0000	4
0.0390	0.0000	0.0390	5
0.0000	0.0000	0.0000	6
0.0000	0.0000	0.0000	7
0.0000	0.0000	0.0000	8
0.0000	0.0000	0.0000	9
0.0390	0.0000	0.0390	10
0.0000	0.0000	0.0000	11
0.0000	0.0000	0.0000	12
0.0000	0.0000	0.0000	13
0.0000	0.0000	0.0000	14
0.0390	0.0000	0.0390	15
0.0000	0.0000	0.0000	16
1.2740	208.4914	1.2740	17
0.0000	0.0000	0.0000	18
0.0000	0.0000	0.0000	19
0.0000	0.0000	0.0000	20
0.0000	0.0000	0.0000	21
0.0390	0.0000	0.0390	22
0.0000	0.0000	0.0000	23
0.0000	0.0000	0.0000	24
0.0000	0.0000	0.0000	25

081480-INSULATION, PIPE

0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.3380	0.4240	0.3380
0.0000	0.0000	0.0000
0.3380	0.4240	0.3380
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.3380	0.4240	0.3380
0.0000	0.0000	0.0000
0.3380	0.4240	0.3380
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.3380	0.4240	0.3380
0.0000	0.0000	0.0000
31.4990	678.4000	31.4990
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.3380	0.4240	0.3380
0.0000	0.0000	0.0000
0.3380	0.4240	0.3380
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.3380	0.4240	0.3380
0.0000	0.0000	0.0000
0.3380	0.4240	0.3380

Caces No.:081490-CIRC. PUMP - 1/12 HP.

0.2184	0.5512	0.2184	1
0.2184	0.5512	0.2184	2
0.2184	0.5512	0.2184	3
0.2184	0.5512	0.2184	4
0.8034	2.0352	0.8034	5
0.2184	0.5512	0.2184	6
0.2184	0.5512	0.2184	7
0.2184	0.5512	0.2184	8
0.2184	0.5512	0.2184	9
1.0790	212.0000	0.5395	10
0.2184	0.5512	0.2184	11
0.2184	0.5512	0.2184	12
0.2184	0.5512	0.2184	13
0.2184	0.5512	0.2184	14
0.8034	2.0352	0.8034	15
0.2184	0.5512	0.2184	16
0.2184	0.5512	0.2184	17
0.2184	0.5512	0.2184	18
0.2184	0.5512	0.2184	19
1.0790	212.0000	0.5395	20
0.2184	0.5512	0.2184	21
0.2184	0.5512	0.2184	22
0.2184	0.5512	0.2184	23
0.2184	0.5512	0.2184	24
0.8034	2.0352	0.8034	25

0814A0-CIRC. PUMP - 1/6 HP.

0.2184	0.5512	0.2184
0.2184	0.5512	0.2184
0.2184	0.5512	0.2184
0.2184	0.5512	0.2184
0.8203	2.3320	0.8203
0.2184	0.5512	0.2184
0.2184	0.5512	0.2184
0.2184	0.5512	0.2184
0.2184	0.5512	0.2184
1.8460	371.0000	0.9230
0.2184	0.5512	0.2184
0.2184	0.5512	0.2184
0.2184	0.5512	0.2184
0.2184	0.5512	0.2184
0.8203	2.3320	0.8203
0.2184	0.5512	0.2184
0.2184	0.5512	0.2184
0.2184	0.5512	0.2184
0.2184	0.5512	0.2184
1.8460	371.0000	0.9230
0.2184	0.5512	0.2184
0.2184	0.5512	0.2184
0.2184	0.5512	0.2184
0.2184	0.5512	0.2184
0.8203	2.3320	0.8203

25 YEAR COMPONENT LISTING

Caces No.:0814B0-CIRC. PUMP - 1/2 HP. 0814C0-STEAM CONVERTER, DOM. H.W.

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR	LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.3250	0.8268	0.3250	1	0.0923	0.0000	0.0923
0.3250	0.8268	0.3250	2	0.0923	0.0000	0.0923
0.3250	0.8268	0.3250	3	0.0923	0.0000	0.0923
0.3250	0.8268	0.3250	4	6.0333	5.8936	3.0628
1.2129	3.5722	1.2129	5	0.0923	0.0000	0.0923
0.3250	0.8268	0.3250	6	0.0923	0.0000	0.0923
0.3250	0.8268	0.3250	7	0.0923	0.0000	0.0923
0.3250	0.8268	0.3250	8	6.0333	5.8936	3.0628
0.3250	0.8268	0.3250	9	0.0923	0.0000	0.0923
2.8730	542.7200	1.4365	10	0.0923	0.0000	0.0923
0.3250	0.8268	0.3250	11	0.0923	0.0000	0.0923
0.3250	0.8268	0.3250	12	6.0333	5.8936	3.0628
0.3250	0.8268	0.3250	13	0.0923	0.0000	0.0923
0.3250	0.8268	0.3250	14	0.0923	0.0000	0.0923
1.2129	3.5722	1.2129	15	0.0923	0.0000	0.0923
0.3250	0.8268	0.3250	16	6.0333	5.8936	3.0628
0.3250	0.8268	0.3250	17	0.0923	0.0000	0.0923
0.3250	0.8268	0.3250	18	0.0923	0.0000	0.0923
0.3250	0.8268	0.3250	19	0.0923	0.0000	0.0923
2.8730	542.7200	1.4365	20	7.3580	784.4000	3.6790
0.3250	0.8268	0.3250	21	0.0923	0.0000	0.0923
0.3250	0.8268	0.3250	22	0.0923	0.0000	0.0923
0.3250	0.8268	0.3250	23	0.0923	0.0000	0.0923
0.3250	0.8268	0.3250	24	6.0333	5.8936	3.0628
1.2129	3.5722	1.2129	25	0.0923	0.0000	0.0923

Caces No.:0814D0-H.W. HTR.,GAS/OIL,30 GAL. 0814E0-H.W. HTR.,GAS/OIL,80 GAL.

3.0030	0.0000	3.0030	1	3.0030	0.0000	3.0030
3.0030	0.0000	3.0030	2	3.0030	0.0000	3.0030
3.0030	0.0000	3.0030	3	3.0030	0.0000	3.0030
3.0030	0.0000	3.0030	4	3.0030	0.0000	3.0030
4.5747	0.0000	4.5747	5	5.3976	5.9360	5.3976
3.0030	0.0000	3.0030	6	3.0030	0.0000	3.0030
3.0030	0.0000	3.0030	7	3.0030	0.0000	3.0030
3.0030	0.0000	3.0030	8	3.0030	0.0000	3.0030
3.0030	0.0000	3.0030	9	3.0030	0.0000	3.0030
1.0712	145.2200	0.5356	10	5.3976	5.9360	5.3976
3.0030	0.0000	3.0030	11	3.0030	0.0000	3.0030
3.0030	0.0000	3.0030	12	5.6290	716.5600	2.8145
3.0030	0.0000	3.0030	13	3.0030	0.0000	3.0030
3.0030	0.0000	3.0030	14	3.0030	0.0000	3.0030
4.5747	0.0000	4.5747	15	3.0030	0.0000	3.0030
3.0030	0.0000	3.0030	16	3.0030	0.0000	3.0030
3.0030	0.0000	3.0030	17	5.3976	5.9360	5.3976
3.0030	0.0000	3.0030	18	3.0030	0.0000	3.0030
3.0030	0.0000	3.0030	19	3.0030	0.0000	3.0030
1.0712	145.2200	0.5356	20	3.0030	0.0000	3.0030
3.0030	0.0000	3.0030	21	3.0030	0.0000	3.0030
3.0030	0.0000	3.0030	22	5.3976	5.9360	5.3976
3.0030	0.0000	3.0030	23	3.0030	0.0000	3.0030
3.0030	0.0000	3.0030	24	5.6290	716.5600	2.8145
4.5747	0.0000	4.5747	25	3.0030	0.0000	3.0030

Caces No.:0814F0-H.W. HTR.,GAS/OIL,1000 GPH 0814G0-H.W. HTR., GAS/OIL 8-120 G

0.0000	0.0000	0.0000	1	3.0030	0.0000	3.0030
33.8260	0.0000	16.9130	2	3.0030	0.0000	3.0030
0.0000	0.0000	0.0000	3	3.0030	0.0000	3.0030
33.8260	0.0000	16.9130	4	3.0030	0.0000	3.0030
0.0000	0.0000	0.0000	5	5.3976	5.9360	5.3976
33.8260	0.0000	16.9130	6	3.0030	0.0000	3.0030
0.0000	0.0000	0.0000	7	3.0030	0.0000	3.0030
33.8260	0.0000	16.9130	8	3.0030	0.0000	3.0030
0.0000	0.0000	0.0000	9	3.0030	0.0000	3.0030
33.8260	0.0000	16.9130	10	5.3976	5.9360	5.3976
0.0000	0.0000	0.0000	11	3.0030	0.0000	3.0030
33.8260	0.0000	16.9130	12	5.6290	986.8600	2.8145
0.0000	0.0000	0.0000	13	3.0030	0.0000	3.0030
33.8260	0.0000	16.9130	14	3.0030	0.0000	3.0030
0.0000	0.0000	0.0000	15	3.0030	0.0000	3.0030
33.8260	0.0000	16.9130	16	3.0030	0.0000	3.0030
0.0000	0.0000	0.0000	17	5.3976	5.9360	5.3976
33.8260	0.0000	16.9130	18	3.0030	0.0000	3.0030
0.0000	0.0000	0.0000	19	3.0030	0.0000	3.0030
45.9940	6371.0452	22.9970	20	3.0030	0.0000	3.0030
0.0000	0.0000	0.0000	21	3.0030	0.0000	3.0030
33.8260	0.0000	16.9130	22	5.3976	5.9360	5.3976
0.0000	0.0000	0.0000	23	3.0030	0.0000	3.0030
33.8260	0.0000	16.9130	24	5.6290	986.8600	2.8145
0.0000	0.0000	0.0000	25	3.0030	0.0000	3.0030

25 YEAR COMPONENT LISTING

Caces No.:0814H0-H.W. HTR. ELEC. 120 GAL. 0814I0-H.W. HEATER ELEC. 300 GAL.

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR	LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000	1	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	2	0.0000	0.0000	0.0000
0.0572	0.0000	0.0572	3	0.0572	0.0000	0.0572
0.0000	0.0000	0.0000	4	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	5	0.0000	0.0000	0.0000
0.0572	0.0000	0.0572	6	0.0572	0.0000	0.0572
4.6540	0.0000	4.6540	7	4.6540	0.0000	4.6540
0.0000	0.0000	0.0000	8	0.0000	0.0000	0.0000
0.0572	0.0000	0.0572	9	0.0572	0.0000	0.0572
0.0000	0.0000	0.0000	10	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	11	0.0000	0.0000	0.0000
0.0572	0.0000	0.0572	12	0.0572	0.0000	0.0572
0.0000	0.0000	0.0000	13	0.0000	0.0000	0.0000
4.6540	0.0000	4.6540	14	4.6540	0.0000	4.6540
4.7060	3047.5000	2.3530	15	4.7060	5644.5000	2.3530
0.0000	0.0000	0.0000	16	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	17	0.0000	0.0000	0.0000
0.0572	0.0000	0.0572	18	0.0572	0.0000	0.0572
0.0000	0.0000	0.0000	19	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	20	0.0000	0.0000	0.0000
0.0572	0.0000	0.0572	21	0.0572	0.0000	0.0572
4.6540	0.0000	4.6540	22	4.6540	0.0000	4.6540
0.0000	0.0000	0.0000	23	0.0000	0.0000	0.0000
0.0572	0.0000	0.0572	24	0.0572	0.0000	0.0572
0.0000	0.0000	0.0000	25	0.0000	0.0000	0.0000

Caces No.:0814J0-H.W. HEATER ELEC. 1000 GAL 0814K0-H.W. HEATER ELEC. 2000 GAL

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR	LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000	1	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	2	0.0000	0.0000	0.0000
0.0572	0.0000	0.0572	3	0.0572	0.0000	0.0572
0.0000	0.0000	0.0000	4	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	5	0.0000	0.0000	0.0000
0.0572	0.0000	0.0572	6	0.0572	0.0000	0.0572
4.6540	0.0000	4.6540	7	4.6540	0.0000	4.6540
0.0000	0.0000	0.0000	8	0.0000	0.0000	0.0000
0.0572	0.0000	0.0572	9	0.0572	0.0000	0.0572
0.0000	0.0000	0.0000	10	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	11	0.0000	0.0000	0.0000
0.0572	0.0000	0.0572	12	0.0572	0.0000	0.0572
0.0000	0.0000	0.0000	13	0.0000	0.0000	0.0000
4.6540	0.0000	4.6540	14	4.6540	0.0000	4.6540
4.7060	14654.5000	2.3530	15	4.7060	18894.5000	2.3530
0.0000	0.0000	0.0000	16	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	17	0.0000	0.0000	0.0000
0.0572	0.0000	0.0572	18	0.0572	0.0000	0.0572
0.0000	0.0000	0.0000	19	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	20	0.0000	0.0000	0.0000
0.0572	0.0000	0.0572	21	0.0572	0.0000	0.0572
4.6540	0.0000	4.6540	22	4.6540	0.0000	4.6540
0.0000	0.0000	0.0000	23	0.0000	0.0000	0.0000
0.0572	0.0000	0.0572	24	0.0572	0.0000	0.0572
0.0000	0.0000	0.0000	25	0.0000	0.0000	0.0000

Caces No.:0814L0-H.W. HTR.,ELEC.,52 GAL. 0814M0-STORAGE TANK, DHW

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR	LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000	1	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	2	3.7330	5.3000	3.7330
0.0572	0.0000	0.0572	3	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	4	3.7330	5.3000	3.7330
0.0000	0.0000	0.0000	5	0.0000	0.0000	0.0000
0.0572	0.0000	0.0572	6	3.7330	5.3000	3.7330
4.6540	0.0000	4.6540	7	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	8	3.7330	5.3000	3.7330
0.0572	0.0000	0.0572	9	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	10	3.7330	5.3000	3.7330
0.0000	0.0000	0.0000	11	0.0000	0.0000	0.0000
4.7060	186.5600	2.3530	12	3.7330	5.3000	3.7330
0.0000	0.0000	0.0000	13	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	14	3.7330	5.3000	3.7330
0.0572	0.0000	0.0572	15	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	16	3.7330	5.3000	3.7330
0.0000	0.0000	0.0000	17	0.0000	0.0000	0.0000
0.0572	0.0000	0.0572	18	3.7330	5.3000	3.7330
4.6540	0.0000	4.6540	19	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	20	3.7330	5.3000	3.7330
0.0572	0.0000	0.0572	21	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	22	3.7330	5.3000	3.7330
0.0000	0.0000	0.0000	23	0.0000	0.0000	0.0000
4.7060	186.5600	2.3530	24	3.7330	5.3000	3.7330
0.0000	0.0000	0.0000	25	0.0000	0.0000	0.0000

25 YEAR COMPONENT LISTING

Caces No.:0814N0-PIPE/FITTINGS, PVC | 081400-CIRC. PUMP > 1 HP

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR	LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000	1	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	2	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	3	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	4	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	5	1.0491	3.3072	1.0491
0.0000	0.0000	0.0000	6	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	7	0.1625	0.5512	0.1625
0.2870	0.0265	0.2870	8	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	9	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	10	1.0491	3.3072	1.0491
0.0000	0.0000	0.0000	11	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	12	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	13	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	14	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	15	1.0491	3.3072	1.0491
0.2870	0.0265	0.2870	16	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	17	0.1625	0.5512	0.1625
0.4171	6.7310	0.2085	18	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	19	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	20	2.8730	1166.0000	1.4365
0.0000	0.0000	0.0000	21	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	22	0.1625	0.5512	0.1625
0.0000	0.0000	0.0000	23	0.1625	0.5512	0.1625
0.2870	0.0265	0.2870	24	0.1625	0.5512	0.1625
41.7053	669.1250	20.8527	25	1.0491	3.3072	1.0491

Caces No.:082110-DRAIN; ROOF, SCUPPER, AREA | 082210-DISTRIBUTION;GUTTERS,PIPE

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR	LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.5070	0.3816	0.5070	1	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	2	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	3	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	4	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	5	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	6	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	7	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	8	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	9	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	10	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	11	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	12	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	13	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	14	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	15	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	16	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	17	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	18	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	19	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	20	206.9990	1155.4000	206.9990
0.5070	0.3816	0.5070	21	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	22	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	23	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	24	5.3040	1.6282	5.3040
0.5070	0.3816	0.5070	25	5.3040	1.6282	5.3040

Caces No.:082310-SUMP PUMP | 083111-SIMPLEX AIR COMPR., 1 HP.

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR	LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.1625	0.2756	0.1625	1	1.4690	1.4628	1.4690
0.1625	0.2756	0.1625	2	1.4690	1.4628	1.4690
0.1625	0.2756	0.1625	3	1.4690	1.4628	1.4690
0.1625	0.2756	0.1625	4	14.7420	14.6598	8.1055
1.0491	3.0316	1.0491	5	1.4690	1.4628	1.4690
0.1625	0.2756	0.1625	6	1.4690	1.4628	1.4690
0.1625	0.2756	0.1625	7	1.4690	1.4628	1.4690
0.1625	0.2756	0.1625	8	14.7420	14.6598	8.1055
0.1625	0.2756	0.1625	9	1.4690	1.4628	1.4690
1.0491	3.0316	1.0491	10	1.4690	1.4628	1.4690
0.1625	0.2756	0.1625	11	1.4690	1.4628	1.4690
0.1625	0.2756	0.1625	12	14.7420	14.6598	8.1055
0.1625	0.2756	0.1625	13	1.4690	1.4628	1.4690
0.1625	0.2756	0.1625	14	1.4690	1.4628	1.4690
1.0491	3.0316	1.0491	15	1.4690	1.4628	1.4690
0.1625	0.2756	0.1625	16	14.7420	14.6598	8.1055
0.1625	0.2756	0.1625	17	1.4690	1.4628	1.4690
0.1625	0.2756	0.1625	18	1.4690	1.4628	1.4690
0.1625	0.2756	0.1625	19	1.4690	1.4628	1.4690
2.8730	408.1000	1.4365	20	14.7420	14.6598	8.1055
0.1625	0.2756	0.1625	21	1.4690	1.4628	1.4690
0.1625	0.2756	0.1625	22	1.4690	1.4628	1.4690
0.1625	0.2756	0.1625	23	1.4690	1.4628	1.4690
0.1625	0.2756	0.1625	24	14.7420	14.6598	8.1055
1.0491	3.0316	1.0491	25	3.6790	6103.8298	1.8395

25 YEAR COMPONENT LISTING

Caces No.:083112-VACUUM PUMP | 083113-GAS COMPRESSOR 7 1/2 HP

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR	LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.3250	9.2750	0.3250	1	1.4690	2.9256	1.4690
0.3250	9.2750	0.3250	2	1.4690	2.9256	1.4690
0.3250	9.2750	0.3250	3	1.4690	2.9256	1.4690
0.3250	9.2750	0.3250	4	14.7420	29.4256	8.1055
4.2250	104.6750	4.2250	5	1.4690	2.9256	1.4690
0.3250	9.2750	0.3250	6	1.4690	2.9256	1.4690
0.3250	9.2750	0.3250	7	1.4690	2.9256	1.4690
0.3250	9.2750	0.3250	8	14.7420	29.4256	8.1055
0.3250	9.2750	0.3250	9	1.4690	2.9256	1.4690
5.8500	2652.1200	2.9250	10	1.4690	2.9256	1.4690
0.3250	9.2750	0.3250	11	1.4690	2.9256	1.4690
0.3250	9.2750	0.3250	12	14.7420	29.4256	8.1055
0.3250	9.2750	0.3250	13	1.4690	2.9256	1.4690
0.3250	9.2750	0.3250	14	1.4690	2.9256	1.4690
4.2250	104.6750	4.2250	15	1.4690	2.9256	1.4690
0.3250	9.2750	0.3250	16	14.7420	29.4256	8.1055
0.3250	9.2750	0.3250	17	1.4690	2.9256	1.4690
0.3250	9.2750	0.3250	18	1.4690	2.9256	1.4690
0.3250	9.2750	0.3250	19	1.4690	2.9256	1.4690
5.8500	2652.1200	2.9250	20	14.7420	29.4256	8.1055
0.3250	9.2750	0.3250	21	1.4690	2.9256	1.4690
0.3250	9.2750	0.3250	22	1.4690	2.9256	1.4690
0.3250	9.2750	0.3250	23	1.4690	2.9256	1.4690
0.3250	9.2750	0.3250	24	14.7420	29.4256	8.1055
4.2250	104.6750	4.2250	25	3.9000	3339.1166	1.9500

Caces No.:083114-GAS COMPRESSOR > 15 HP | 083115-COMPRESSED AIR DRYER

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR	LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
1.4690	4.3884	1.4690	1	0.3250	0.0000	0.3250
1.4690	4.3884	1.4690	2	0.3250	0.0000	0.3250
1.4690	4.3884	1.4690	3	0.3250	0.0000	0.3250
14.7420	57.3884	8.1055	4	0.3250	0.0000	0.3250
1.4690	4.3884	1.4690	5	0.9750	13.2500	0.9750
1.4690	4.3884	1.4690	6	0.3250	0.0000	0.3250
1.4690	4.3884	1.4690	7	0.3250	0.0000	0.3250
14.7420	57.3884	8.1055	8	0.3250	0.0000	0.3250
1.4690	4.3884	1.4690	9	0.3250	0.0000	0.3250
1.4690	4.3884	1.4690	10	3.2500	417.8520	3.2500
1.4690	4.3884	1.4690	11	0.3250	0.0000	0.3250
14.7420	57.3884	8.1055	12	0.3250	0.0000	0.3250
1.4690	4.3884	1.4690	13	0.3250	0.0000	0.3250
1.4690	4.3884	1.4690	14	0.3250	0.0000	0.3250
1.4690	4.3884	1.4690	15	1.9500	1780.3000	1.9500
14.7420	57.3884	8.1055	16	0.3250	0.0000	0.3250
1.4690	4.3884	1.4690	17	0.3250	0.0000	0.3250
1.4690	4.3884	1.4690	18	0.3250	0.0000	0.3250
1.4690	4.3884	1.4690	19	0.3250	0.0000	0.3250
14.7420	57.3884	8.1055	20	0.9750	13.2500	0.9750
1.4690	4.3884	1.4690	21	0.3250	0.0000	0.3250
1.4690	4.3884	1.4690	22	0.3250	0.0000	0.3250
1.4690	4.3884	1.4690	23	0.3250	0.0000	0.3250
14.7420	57.3884	8.1055	24	0.3250	0.0000	0.3250
4.5500	5353.5936	2.2750	25	3.2500	417.8520	3.2500

Caces No.:083121-HOSE, COMPRESSED AIR | 083131-PIPE/FITTINGS COMPR. AIR

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR	LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000	1	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	2	0.0195	0.0000	0.0195
0.0000	0.0000	0.0000	3	10.7445	22.0480	5.3723
0.0000	0.0000	0.0000	4	0.0195	0.0000	0.0195
0.4680	23.4260	0.4680	5	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	6	10.7640	22.0480	5.3918
0.0000	0.0000	0.0000	7	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	8	0.0195	0.0000	0.0195
0.0000	0.0000	0.0000	9	10.7445	22.0480	5.3723
0.4680	23.4260	0.4680	10	0.0195	0.0000	0.0195
0.0000	0.0000	0.0000	11	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	12	10.7640	22.0480	5.3918
0.0000	0.0000	0.0000	13	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	14	0.0195	0.0000	0.0195
0.4680	23.4260	0.4680	15	10.7445	22.0480	5.3723
0.0000	0.0000	0.0000	16	0.0195	0.0000	0.0195
0.0000	0.0000	0.0000	17	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	18	10.7640	22.0480	5.3918
0.0000	0.0000	0.0000	19	0.0000	0.0000	0.0000
0.4680	23.4260	0.4680	20	0.0195	0.0000	0.0195
0.0000	0.0000	0.0000	21	10.7445	22.0480	5.3723
0.0000	0.0000	0.0000	22	0.0195	0.0000	0.0195
0.0000	0.0000	0.0000	23	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	24	10.7640	22.0480	5.3918
0.4680	23.4260	0.4680	25	0.0000	0.0000	0.0000

25 YEAR COMPONENT LISTING

Caces No.:083211-SIMPLEX GAS COMPR., 1 HP.

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
1.4690	1.4628	1.4690	1
1.4690	1.4628	1.4690	2
1.4690	1.4628	1.4690	3
14.7420	14.6598	8.1055	4
1.4690	1.4628	1.4690	5
1.4690	1.4628	1.4690	6
1.4690	1.4628	1.4690	7
14.7420	14.6598	8.1055	8
1.4690	1.4628	1.4690	9
1.4690	1.4628	1.4690	10
1.4690	1.4628	1.4690	11
14.7420	14.6598	8.1055	12
1.4690	1.4628	1.4690	13
1.4690	1.4628	1.4690	14
1.4690	1.4628	1.4690	15
14.7420	14.6598	8.1055	16
1.4690	1.4628	1.4690	17
1.4690	1.4628	1.4690	18
1.4690	1.4628	1.4690	19
14.7420	14.6598	8.1055	20
1.4690	1.4628	1.4690	21
1.4690	1.4628	1.4690	22
1.4690	1.4628	1.4690	23
14.7420	14.6598	8.1055	24
3.6790	1365.8206	1.8395	25

083221-HOSE, INDUSTRIAL GAS

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.4680	23.4260	0.4680
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.4680	23.4260	0.4680
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.4680	23.4260	0.4680
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.4680	23.4260	0.4680
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.4680	23.4260	0.4680

Caces No.:083221-PIPE/FITTINGS,INDUST. GAS

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.0000	0.0000	0.0000	1
0.0195	0.0000	0.0195	2
0.0000	0.0000	0.0000	3
10.7640	22.0480	5.3918	4
0.0000	0.0000	0.0000	5
0.0195	0.0000	0.0195	6
0.0000	0.0000	0.0000	7
10.7640	22.0480	5.3918	8
0.0000	0.0000	0.0000	9
0.0195	0.0000	0.0195	10
0.0000	0.0000	0.0000	11
10.7640	22.0480	5.3918	12
0.0000	0.0000	0.0000	13
0.0195	0.0000	0.0195	14
0.0000	0.0000	0.0000	15
10.7640	22.0480	5.3918	16
0.0000	0.0000	0.0000	17
0.0195	0.0000	0.0195	18
0.0000	0.0000	0.0000	19
10.7640	22.0480	5.3918	20
0.0000	0.0000	0.0000	21
0.0195	0.0000	0.0195	22
0.0000	0.0000	0.0000	23
10.7640	22.0480	5.3918	24
0.0000	0.0000	0.0000	25

083311-PIPE/FITTINGS, ANETHESIA

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
5.5510	11.1300	2.7755
0.1846	0.0848	0.1846
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
5.5510	11.1300	2.7755
555.1000	1113.0000	277.5500

Caces No.:083321-PIPE/FITTINGS, OXYGEN

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.0000	0.0000	0.0000	1
0.0000	0.0000	0.0000	2
0.0000	0.0000	0.0000	3
0.0000	0.0000	0.0000	4
0.0000	0.0000	0.0000	5
0.0000	0.0000	0.0000	6
0.0000	0.0000	0.0000	7
0.0000	0.0000	0.0000	8
0.0000	0.0000	0.0000	9
0.0000	0.0000	0.0000	10
0.0000	0.0000	0.0000	11
5.5510	11.1300	2.7755	12
0.1846	0.0848	0.1846	13
0.0000	0.0000	0.0000	14
0.0000	0.0000	0.0000	15
0.0000	0.0000	0.0000	16
0.0000	0.0000	0.0000	17
0.0000	0.0000	0.0000	18
0.0000	0.0000	0.0000	19
0.0000	0.0000	0.0000	20
0.0000	0.0000	0.0000	21
0.0000	0.0000	0.0000	22
0.0000	0.0000	0.0000	23
5.5510	11.1300	2.7755	24
555.1000	1113.0000	277.5500	25

084110-DISHWASHER

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
3.9000	15.4124	3.9000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
3.9000	15.4124	3.9000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
3.9000	15.4124	3.9000
6.0060	459.3298	3.0030
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
3.9000	15.4124	3.9000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
3.9000	15.4124	3.9000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
3.9000	15.4124	3.9000
6.0060	459.3298	3.0030
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
3.9000	15.4124	3.9000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000

25 YEAR COMPONENT LISTING

Caces No.:084120-WASTE DISPOSAL, RESIDENT.

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.8710	0.0000	0.8710	1
0.8710	0.0000	0.8710	2
0.8710	0.0000	0.8710	3
0.8710	0.0000	0.8710	4
0.8710	0.0000	0.8710	5
0.8710	0.0000	0.8710	6
0.8710	0.0000	0.8710	7
1.2740	110.4202	1.2740	8
0.8710	0.0000	0.8710	9
0.8710	0.0000	0.8710	10
0.8710	0.0000	0.8710	11
0.8710	0.0000	0.8710	12
0.8710	0.0000	0.8710	13
0.8710	0.0000	0.8710	14
0.8710	0.0000	0.8710	15
1.2740	110.4202	1.2740	16
0.8710	0.0000	0.8710	17
0.8710	0.0000	0.8710	18
0.8710	0.0000	0.8710	19
0.8710	0.0000	0.8710	20
0.8710	0.0000	0.8710	21
0.8710	0.0000	0.8710	22
0.8710	0.0000	0.8710	23
1.2740	110.4202	1.2740	24
0.8710	0.0000	0.8710	25

084130-WATER SOFTENER

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200
7.6700	412.3400	7.6700
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200
5.2000	731.4000	2.6000
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200
7.6700	412.3400	7.6700
7.0200	407.0400	7.0200
7.0200	407.0400	7.0200

Caces No.:084411-SPRINKLER HEAD

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS	YR
0.0134	0.0000	0.0134	1
0.0134	0.0000	0.0134	2
0.0134	0.0000	0.0134	3
0.0134	0.0000	0.0134	4
0.0134	0.0000	0.0134	5
0.0134	0.0000	0.0134	6
0.0134	0.0000	0.0134	7
0.0134	0.0000	0.0134	8
0.0134	0.0000	0.0134	9
0.6634	2.1200	0.6634	10
0.0134	0.0000	0.0134	11
0.0134	0.0000	0.0134	12
0.0134	0.0000	0.0134	13
0.0134	0.0000	0.0134	14
0.0134	0.0000	0.0134	15
0.0134	0.0000	0.0134	16
0.0134	0.0000	0.0134	17
0.0134	0.0000	0.0134	18
0.0134	0.0000	0.0134	19
0.3250	4.1870	0.3250	20
0.0134	0.0000	0.0134	21
0.0134	0.0000	0.0134	22
0.0134	0.0000	0.0134	23
0.0134	0.0000	0.0134	24
0.0134	0.0000	0.0134	25

091110-GAS METER

LABOR HOURS	MATERIALS $	EQUIPMENT HOURS
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.3900	98.5800	0.3900
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000
0.0000	0.0000	0.0000

APPENDIX B:

GEOGRAPHICAL LOCATION FACTORS

State	Location	ACF Index
Alabama	State Average	.86
	Birmingham	.96
	Mobile	.86
	Montgomery	.76
	Anniston Army Depot	.81
	Huntsville	.88
	Fort McClellan	.80
	Redstone Arsenal	.88
	Fort Rucker	.80
Alaska	State Average	2.25
	Anchorage	1.92
	Delta Junction	2.70
	Fairbanks	2.13
	Adak	3.88
	Aleutian Islands	3.86
	Anchorage NSGA	1.92
	Barrow	4.18
	Burnt Mtn.	6.86
	Clear	3.10
	Eielson AFB	2.13
	Elmendorf AFB	1.92
	Galena	3.73
	Fort Greely	2.70
	Fort Richardson	1.92
	Fort Wainwright	2.13
Arizona	State Average	1.02
	Flagstaff	1.02
	Phoenix	.99
	Tucson	1.05
	Fort Huachuca	1.22
	Yuma Proving Ground	1.31
	Yuma	1.31
Arkansas	State Average	.89
	Pinebluff	.93
	Little Rock	.83
	Fort Smith	.92
	Fort Chaffee	.92
	Pine Bluff Arsenal	.93
California	State Average	1.21
	Los Angeles	1.20
	San Diego	1.18
	San Francisco	1.25
	Beale	1.28
	Bridgeport NWTC	1.27
	Castle	1.13
	Centerville Beach	1.32
	Desert Area	1.18
	Edwards AFB	1.30

State	Location	ACF Index
California (Cont'd)	El Centro	1.27
	George AFB	1.31
	Fort Hunter Liggett	1.29
	Fort Irwin	1.20
	Le Moore NAS	1.20
	March AFB	1.18
	Mather AFB	1.17
	McClellan AFB	1.17
	Monterey Area	1.23
	Presidio of Monterey	1.23
	Norton AFB	1.16
	Oakland Army Base	1.33
	Fort Ord	1.24
	Port Huenema Area	1.20
	Riverside	1.18
	Sacramento	1.15
	Sacramento Army Depot	1.15
	Presidio of San Francisco	1.25
	San Nicholas Island	2.59
	Sharpe Army Depot	1.13
	Sierra Army Depot	1.33
	Stockton	1.15
	Travis AFB	1.27
	Vandenburg AFB	1.38
Colorado	State Average	.98
	Colorado Springs	.94
	Denver	1.04
	Pueblo	.96
	Fort Carson	1.01
	Fitzsimmons AMC	1.06
	Pueblo Army Depot	.96
	Peterson AFB	.94
	Rocky Mountain Arsenal	1.06
Connecticut	State Average	1.13
	Bridgeport	1.16
	Hartford	1.10
	New London	1.14
Delaware	State Average	.99
	Dover	1.04
	Lewes	.98
	Milford	.96
	Lewes NF	1.04
	Dover AFB	1.04
District of Columbia	Washington	1.03
	Fort McNair	1.03
	Walter Reed AMC	1.03
Florida	State Average	.89
	Miami	.95
	Panama City	.92
	Tampa	.79
	Cape Canaveral	.96
	Cape Kennedy	.96

State	Location	ACF Index
Florida (Cont'd)	Gulf Coast	.85
	Homestead AFB	.88
	Homestead	.88
	Jacksonville Area	.85
	Key West NAS	1.08
	Orlando	.80
	Pensacola Area	.85
	McDill AFB	.77
	Eglin AFB	.77
	Tyndall AFB	.92
Georgia	State Average	.80
	Albany	.82
	Atlanta	.87
	Macon	.70
	Athens	.90
	Atlanta-Marietta	.93
	Fort Benning	.71
	Columbus	.71
	Fort Gillem	.87
	Fort Gordon	.94
	Kings Bay	.93
	Fort McPherson	.87
	Fort Stewart	.84
Hawaii	State Average	1.28
	Hawaii	1.29
	Honolulu	1.27
	Maui	1.29
	Alimanu	1.27
	Barbars Point NAS	1.34
	Fort Debussy	1.27
	EWA Beach Area	1.34
	Helemano	1.34
	Hickam Army Air Field	1.27
	Kaneohe MCAS	1.34
	Moanalua	1.27
	Pearl City	1.27
	Pearl Harbor	1.27
	Pohakuloa	1.32
	Schofield Barracks	1.27
	Fort Shafter	1.27
	Tripler AMC	1.27
	Wheeler Army Air Field	1.34
Idaho	State Average	1.11
	Boise	1.05
	Idaho Falls	1.08
	Mountain Home	1.19
	Mountain Home AFB	1.20
Illinois	State Average	1.03
	Belleville	.96
	Chicago	1.09
	Rock Island	1.03
	Rock Island Arsenal	1.06

State	Location	ACF Index
Illinois (Cont'd)	St. Louis Support Ctr	.96
	Savannah Army Depot	1.05
	Scott AFB	1.03
	Fort Sheridan	1.10
Indiana	State Average	.99
	Indianapolis	1.03
	Logansport	.99
	Madison	.94
	Fort Benjamin Harrison	1.07
	Crane	1.10
	Crane AAP	1.10
	Grissom AFB	1.06
	Indiana AAP	1.02
	Jefferson Proving Ground	.94
Iowa	State Average	1.02
	Burlington	1.04
	Cedar Rapids	.98
	Des Moines	1.05
	Iowa AAP	1.06
Kansas	State Average	.94
	Manhattan	.97
	Topeka	.96
	Wichita	.88
	Kansas AAP	.94
	Fort Leavenworth	.94
	Fort Riley	.97
	Sunflower AAP	.97
Kentucky	State Average	.96
	Bowling Green	.99
	Lexington	.96
	Louisville	.93
	Fort Campbell	.93
	Fort Knox	.99
	Lexington/Bluegrass Army Depot	1.06
	Louisville NAS	.93
Louisiana	State Average	.92
	Alexandria	.87
	New Orleans	.94
	Shreveport	.94
	Barksdale AFB	.94
	England AFB	.87
	Gulf Outport New Orleans	.94
	Louisiana AAP	.94
	Fort Polk	.94
Maine	State Average	.93
	Bangor	.85
	Caribou	.99
	Portland	.94
	Brunswick	.93
	Cutler	.98
	Northern Area	1.17
	Winter Harbor	.98

State	Location	ACF Index
Maryland	State Average	.97
	Baltimore	.95
	Fredrick	.94
	Lexington Park	1.01
	Aberdeen Proving Ground	.94
	Annapolis	1.03
	Fort Detrick	.94
	Harry Diamond Lab	1.00
	Fort Meade	.95
	Patuxent River Area	1.08
	Fort Ritchie	.90
Massachusetts	State Average	1.10
	Boston	1.13
	Fitchburg	1.08
	Springfield	1.08
	Army Mtls & Mech Research Ctr	1.13
	Fort Devens	1.15
	Natick Research & Development Ctr	1.13
	South Weymouth	1.13
Michigan	State Average	1.06
	Bay City	1.02
	Detroit	1.14
	Marquette	1.03
	Detroit Arsenal	1.14
	Northern Area	1.25
	Republic (Elfcom)	1.10
	Selfridge AFB	1.14
Minnesota	State Average	1.08
	Duluth	1.05
	Minneapolis	1.09
	St. Cloud	1.10
	Twin Cities AAP	1.09
Mississippi	State Average	.84
	Biloxi	.87
	Columbus	.81
	Jackson	.84
	Columbus AFB	.81
	Gulfport Area	.87
	Meridian	.92
Missouri	State Average	.92
	Kansas City	.92
	St. Louis	.99
	Rolla	.85
	Lake City AAP	.93
	Fort Leonard Wood	.91
Montana	State Average	1.15
	Billings	1.15
	Butte	1.18
	Great Falls	1.12
	Malmstrom AFB	1.12
Nebraska	State Average	1.03
	Grand Island	1.00

State	Location	ACF Index
Nebraska (Cont'd)	Lincoln	1.05
	Omaha	1.05
	Offutt AFB	1.05
Nevada	State Average	1.18
	Hawthorne	1.26
	Las Vegas	1.13
	Reno	1.15
	Fallon	1.28
	Hawthorne AAP	1.26
	Nellis AFB	1.13
New Hampshire	State Average	1.09
	Concord	1.06
	Nashua	1.06
	Portsmouth	1.14
	Cold Regions Lab	1.17
New Jersey	State Average	1.08
	Newark	1.11
	Red Bank	1.08
	Trenton	1.06
	Bayonne	1.10
	Bayonne Mil Ocean Term	1.09
	Fort Dix	1.03
	Earle	1.10
	Lakehurst	1.05
	Fort Monmouth	1.09
	Picatinny Arsenal	1.20
New Mexico	State Average	1.03
	Alamogordo	.99
	Albuquerque	1.03
	Gallup	1.06
	Holloman AFB	1.05
	Kirtland AFB	1.03
	White Sands Missile Range	1.09
	Fort Wingate	1.06
New York	State Average	1.12
	Albany	1.07
	New York City	1.24
	Syracuse	1.05
	Brooklyn	1.24
	Fort Drum	1.18
	Fort Hamilton	1.24
	Seneca Army Depot	1.15
	U.S. Military Academy	1.17
	Watervliet Arsenal	1.07
North Carolina	State Average	.76
	Fayetteville	.76
	Greensboro	.75
	Wilmington	.78
	Fort Bragg	.76
	Camp Lejeune Area	.86
	Cherry Point	.86
	Goldsboro	.77

State	Location	ACF Index
North Carolina (Cont'd)	Pope AFB	.82
	Seymour AFB	.77
	Sunny Point Mil Ocean Term	.78
North Dakota	State Average	1.03
	Bismarck	1.02
	Grand Forks	.98
	Minot	1.10
	Grand Forks AFB	.98
	Stanley R. Hicklesen CPX	1.03
	Minot AFB	1.12
Ohio	State Average	1.00
	Columbus	1.03
	Dayton	.98
	Youngstown	.99
	Cleveland	1.14
	Wright-Patterson AFB	.98
Oklahoma	State Average	.93
	Lawton	.90
	McAlester	.91
	Oklahoma City	.98
	Altus AFB	.94
	Enid	1.01
	McAlester AAP	.91
	Fort Sill	.90
Oregon	State Average	1.05
	Pendleton	1.08
	Portland	1.07
	Salem	.99
	Charleston	1.11
	Coos Head	1.08
	Umatilla Army Depot	1.18
Pennsylvania	State Average	1.00
	Harrisburg	.91
	Philadelphia	1.05
	Pittsburgh	1.04
	Carlisle Barracks	.93
	New Cumberland Army Depot	.91
	Fort Indiantown Gap	1.07
	Letterkenny Army Depot	1.07
	Mechanicsburg Area	.91
	Tobyhanna Army Depot	1.14
	Warminster Area	1.04
Rhode Island	State Average	1.11
	Bristol	1.13
	Newport	1.11
	Providence	1.10
	Davisville	1.17
South Carolina	State Average	.82
	Charleston	.81
	Columbia	.82
	Myrtle Beach	.84
	Beaufort Area	.89

State	Location	ACF Index
South Carolina (Cont'd)	Charleston AFB	.81
	Fort Jackson	.82
	Sumter	.80
South Dakota	State Average	.95
	Aberdeen	.95
	Sioux Falls	.94
	Rapid City	.96
	Ellsworth AFB	.98
Tennessee	State Average	.84
	Chattanooga	.86
	Kingsport	.72
	Memphis	.95
	Arnold AFB	.90
	Milan AAP	.98
	Holston AAP	.71
Texas	State Average	.85
	San Angelo	.76
	San Antonio	.86
	Fort Worth	.93
	Fort Bliss	.96
	Carswell AFB	.93
	Chase Field - Beeville	.97
	Corpus Christi Army Depot	.92
	Corpus Christi	.92
	Dallas	.93
	Dyess AFB	.94
	Fort Hood	.89
	Kingsville	.99
	Red River Army Depot	.78
	Fort Sam Houston	.86
	William Beaumont AMC	.96
	Bergstrom AFB	.95
	Brooks AFB	.86
	Randolph AFB	.86
	Kelly AFB	.86
	Lackland AFB	.86
Utah	State Average	1.03
	Ogden	1.05
	Salt Lake City	1.00
	Tooele	1.06
	Dugway Proving Ground	1.03
	Hill AFB	1.07
	Tooele Army Depot	1.05
Vermont	State Average	.99
	Burlington	1.00
	Montpelier	1.00
	Rutland	.96
Virginia	State Average	.95
	Norfolk	.95
	Radford	.95
	Richmond	.94
	Arlington	1.04

State	Location	ACF Index
Virginia (Cont'd)	Arlington Hall Station	1.04
	Arlington National Cemetery	1.04
	Fort Belvoir	1.04
	Cameron Station	1.04
	Dahlgren	1.10
	Fort Eustis	.96
	Humphreys Engineer Center	1.03
	Fort A. P. Hill	.92
	Fort Lee	.93
	Fort Monroe	.94
	Fort Myer	1.03
	Norfolk-Newport News Area	.95
	Fort Pickett	.98
	Quantico	1.03
	Nadford AAP	1.02
	Port Story	.95
	Vint Hill Farms Station	1.08
Washington	State Average	1.09
	Spokane	1.08
	Tacoma	1.07
	Yakima	1.11
	Fairchild AFB	1.13
	Jim Creek	1.34
	Fort Lewis	1.07
	Pacific Beach	1.27
	Puget Sound Area	1.15
	Seattle Area	1.12
	Widbey Island	1.12
	Yakima Firing Center	1.18
West Virginia	State Average	.95
	Bluefield	.92
	Clarksburg	.95
	Charleston	.99
	Sugar Grove	1.15
Wisconsin	State Average	1.06
	LaCrosse	1.04
	Madison	1.02
	Milwaukee	1.13
	Badger AAP	1.06
	Clam Lake	1.20
	Fort McCoy	1.11
Wyoming	State Average	1.08
	Casper	1.07
	Cheyenne	1.10
	Laramie	1.08
	F. E. Warren AFB	1.10

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